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cover story

This issue of the *Digest* features condensations of several articles on recent research on sleep and dreaming.

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The Serotonin-Catecholamine-Dream Bicycle: A Clinical Study

Richard J. Wyatt

Waking, REM, and NREM sleep, are frequently considered to be separate and unique conscious states. REM sleep is characterized by rapid eye movements, a low-voltage electroencephalogram (EEG), active inhibition of muscular tone, rapid alternation of cardiorespiratory function, penile erections, and in humans, dreaming. NREM sleep is characterized by the absence of rapid eye movements, the presence of sleep spindles, high-voltage slow waves (SW), closure of the eyes, and the partial preservation of muscular tone.

For man, the night is initiated with about 90 minutes of NREM sleep before REM sleep introduces itself. Then REM sleep alternates with NREM sleep in 90-minute cycles throughout the night. The REM periods become longer as the night progresses and the amount of REM grows to occupy 20-25 percent of total sleep. That portion of NREM sleep in which slow waves (Stage III and IV or delta sleep) are most prominent predominates early in the night and occupies less than 20 percent of the whole night.

REM sleep is associated with phenomena having both tonic and phasic characteristics. The continuous fast low-voltage EEG activity and loss of muscular tone are tonic phenomena. The rapid eye movements and monophasic sharp waves occurring in the pons, lateral geniculate body, and occipital cortex (PGO spikes) are examples of phasic events.

Sixty-two patients with medical and psychiatric illnesses were studied. The use of experimental drugs was necessary for therapeutic purposes in these patients. In additon, 15 young normal volunteers were studied.

The wards were designed with cables connecting a plug over the subject's regular hospital bed to a central monitoring station so that EEG recording could be carried out with minimum inconvenience to the subject. The subjects plugged their headset with standard-sleep EEG, electromyogram, and electrooculogram electrodes in at 11:30 p.m. and were allowed to sleep for 8 hours. The records were scored by an experimenter unaware of the patient's identity or drugs status according to standard criteria.

Each subject was recorded for at least two adaptation nights prior to at least five nights of placebo capsules. The active drug was administered for at least five nights, and when possible, five or more postdrug placebo nights were recorded.

Serotonergic System

Parachlorophenylalanine and 5-hydroxytryptophan: Effect of decreasing and increasing brain serotonin concentrations—Parachlorophenylalanine (PCPA), which decreases brain serotonin by inhibiting tryptophan hydroxylase, was given to 13 patients in oral dosages of 2–4 grams/24 hours for periods lasting from 14 nights to 3 years. PCPA produced a decrease in REM sleep ranging from 20–70 percent. The maximum decrease in REM sleep usually did not occur until 2–3 weeks of PCPA treatment. Although three subjects had a slight increase in NREM sleep, the amount and

stages of NREM sleep were not significantly changed. There appeared to be a diminution in the number of sleep spindles and a marked increase in isolated rapid eye movements occurring in Stage II sleep. There was no REM rebound when PCPA was discontinued, which appears to be unique since there is usually an REM compensation following REM suppression. In fact, the return of REM sleep to normal after PCPA was discontinued took over 3 weeks, indicating that in the human brain PCPA is probably an irreversible inhibitor of tryptophan hydroxylase. The failure of REM's compensation to occur suggests that PCPA interferes with a fundamental metabolic step in REM sleep formation.

Although it seemed likely that the PCPA-induced decrease in REM sleep was due to a decrease in brain serotonin, it could have been due to some other action. Restoration of REM sleep by increasing brain serotonin in the presence of PCPA would show that the decrease in serotonin was responsible for the fall in REM sleep. DL–5–HTP monohydrate (400–800 milligrams) was given for five or six consecutive nights to four patients taking PCPA at a time when REM sleep was maximumly decreased. The dosage was divided and given 135 and 15 minutes before bedtime. On the 5–HTP nights, there was moderate-to-total REM return in three of the patients and no increase in the fourth. The one patient with complete REM sleep restoration had a pre-PCPA baseline of 100 minutes which decreased to 25 minutes on PCPA. Oral 5–HTP elevated the REM sleep in the presence of PCPA to a mean of 94 minutes which then fell back to 25 minutes when 5–HTP was discontinued. NREM sleep was not affected.

To determine if increasing brain serotonin could elevate REM sleep from normal, DL–5–HTP monohydrate (200 milligrams at 9.15 p.m. and 400 milligrams at 11:15 p.m.) was administered to eight normal subjects for five consecutive nights preceded and followed by five placebo periods. In each subject there was an increase in REM sleep and the percent of night spent in REM sleep. No changes were seen in Stages III and IV. There was a trend toward a decrease in NREM sleep. No further REM sleep increases were noted when 800 milligrams of DL–5–HTP was administered to two subjects.

L-tryptophan—A natural sedative—L-tryptophan was administered to five normal subjects for 10 nights, preceded and followed by five placebo control nights. It was given at 11:00 p.m., one-half hour before bedtime. The subjects were allowed to sleep until they awoke naturally. There was a mean increase in total sleep from pre- and postdrug placebo baselines of 470 and 473 minutes respectively to 541 minutes. Similarly, SW (Stage III and IV) sleep increased from mean pre- and postdrug values of 50 and 51 minutes to 70 minutes. REM sleep decreased from pre- and postdrug placebo means of 128 and 122 minutes to 94 minutes. REM activity also decreased with L-tryptophan administration.

Only small increases were found in the normals' total sleep with tryptophan, perhaps due to their natural predisposition to get up at a specific hour. In order to test L-trypotophan's soporific effect, it was administered to seven patients with chronic insomnia. They were given L-tryptophan (7.5 grams) one-half hour before bed for five or 10 nights. Placebo baselines of a similar length were monitored before and after drug administration. The increase in total sleep from pre-

drug and postdrug values was greater than 1 hour. The major portion of this change was a diminution in early morning awakening. There was no change in sleep latency, but there was a decrease in intermittent awakening. Although there was a slight increase in REM sleep, this increase was not significant.

In order to determine whether the effects of L-tryptophan were mediated through serotonin or some other mechanism, L-tryptophan (5–14 grams given orally 30 minutes before bedtime) was administered for 3–6 nights to three patients receiving PCPA (3 grams/24 hours). The L-tryptophan was administered after 3 weeks of PCPA therapy, at a time when REM sleep was maximumly depressed. During each of the four trials of tryptophan plus PCPA NREM sleep increased and REM sleep decreased. The percent of the total night spent in NREM sleep also increased while that of REM decreased. There were no changes in SW sleep.

A comparison of monoamine oxidase inhibitors (MAOI)—A complete suppression of REM sleep—Monoamine oxidase, a ubiquitous enzyme, can be inhibited by a number of drugs. MAOIs produce a wide variety of chemical changes. To determine if the sleep changes produced by MAOI were due to the inhibition of monoamine oxidase, MAOIs were administered to three normal subjects and 24 patients, (14 depressed, one with migraine headache, and nine with narcolepsy) for a minimum of 14 nights, following at least five nights of baseline. Three hydrazine MAIOs and one MAOI of a different class were compared. The hydrazines were isocarboxazid (60 milligrams), mebanazine (15 milligrams), phenelzine (60–105 milligrams) and a non-MAOI hydrazine isoniazid (400 milligrams). The nonhydrazine MAOI was pargyline (60–100 milligrams).

In each case, except for the non-MAOI isoniazid, there was a 50 percent to total suppression of REM sleep. There was either no change or a compensatory increase in NREM sleep. Not all subjects had their MAOIs discontinued, since it was not therapeutically indicated. There was a small initial increase in REM sleep, then REM became markedly decreased. When the MAOI was discontinued, there was a REM rebound which in some subjects lasted for periods as long as 3 weeks.

Low dosage of MAOI—A paradoxical effect on REM sleep—Because the MAOIs partially or totally shut off REM sleep, it has been suggested that a metabolite of serotonin is needed to trigger REM sleep. MAOIs, in some species, selectively elevate serotonin concentrations without affecting the catecholamines. There frequently was an initial rise in REM sleep when MAOIs were given. To determine if low dosages of MAOIs would prolong this effect 5 to 15 milligrams/24 hours of phenelzine were administered to four depressed patients. In each patient there was a 3–44 percent increase in REM sleep which lasted until the drug was discontinued.

α-Methyl-5-hydroxytryptophan (AM–5–HTP)—A serotonin-like substance not metabolized by monoamine oxidase—AM–5–HTP is converted in man to α-methylserotonin. Unlike serotonin, α-methlyserotonin is a poor substrate for monoamine oxidase. Because of this, if AM–5–HTP increased REM sleep as did 5–HTP, it would provide evidence that the triggering of REM sleep might not be due to serotonin metabolites. Oral AM–5–HTP (0.50–2 grams/24 hours) was given to three patients with hypertension for from 7–17 days. There was a 4–50

percent increase in REM with dosages of 0.75 grams or higher.

Adrenergic System

α-Methyl-paratyrosine (AMPT) and α-methyl-phenylalanine (AMPA)—Effect of decreasing brain catecholamines—AMPT and AMPA are both tyrosine hydroxylase inhibitors and decrease the content of brain catecholamines. AMPT (five patients) and AMPA (three patients) was administered to eight patients in maximum daily oral dosages of 2–3 grams. During the first five nights that drug dosages exceeded 0.75 milligrams, there was a 3–52 percent REM increase associated with considerable daytime sedation. Patients were prevented from sleeping during the day. Three patients on AMPT had REM sleep that returned to baseline after five nights, while the other two maintained the increased REM sleep for the eight nights of drug administration as did the three patients on AMPA. There was no change in REM sleep with either drug. With AMPT discontinuation there was a marked decrease in NREM sleep in three patients lasting for 1–2 nights. The post-drug REM sleep decreased in the five patients treated with AMPT and persisted up to six nights.

3, 4-Dihydroxyphenylalanine (L-DOPA—Effect of elevating brain catecholamines—L-DOPA, a precursor of dopamine and norepinephrine, was administered to seven patients (three with Parkinson's disease, two with Huntington's chorea, one with dystonia musculorum deformans, and one with essential hypertension). Three patients received L-DOPA in combination with DL-α-methyl-DOPA-hydrazine, a peripheral decarboxylase inhibitor which does not enter the brain. Since peripheral decarboxylase inhibitors block the conversion of exogenous DOPA to dopamine outside the central nervous system, they make more DOPA available for conversion within the brain parenchyma. The dosages of L-DOPA ranged from 3.0–8.8 grams/24 hours without the decarboxylase inihibitor and from 0.8–2.6 grams/24 hours with it. In four patients, data during drug administration were taken from the five nights of highest L-DOPA dosage, while for the other three, the highest drug dosage produced insomnia. and data were taken from the five nights just preceding the highest dosage.

L-DOPA led to a reduction in duration of REM sleep in all seven patients ranging from 4–46 percent below baseline. There was no change in NREM sleep; however the data were preselected to exclude higher dosage levels in three patients because of marked reductions in NREM sleep. Submaximal L-DOPA dosages produced a diminution of REM sleep during the first half of the night with an REM rebound during the second half of the night.

As a test of the apparent transient effect of L-DOPA. two patients were given L-DOPA on a schedule that omitted any drug within the 2 hours preceding bedtime. Under such conditions, REM sleep did not differ from baseline. When the same daily dosage was distributed so that the last dose (500 milligrams L-DOPA) was given 30 minutes before bedtime, sleep was reduced 45 and 49 percent below baseline levels.

Serotenergic—Adrenergic—REM Sleep Interaction

The results of this study indicate that the adrenergic system interacts with the serotonergic system in the production of REM sleep with serotonin augmenting and an adrenergic substance reducing it. The possible interaction between these systems has

been often suspected and there is now considerable biochemical evidence that the adrenergic substances can modify brain serotonin metabolism.

Although it appears that there is some evidence of an adrenergic-serotonergic interaction when drugs are involved, it is not clear if this interaction occurs under natural circumstances. Excess catecholamine concentrations which occur with L–DOPA administration may act through nonphysiologic mechanisms. The opposite effect (increasing REM) occurred after decreasing naturally occurring catecholamines with AMPT and AMPA. The latter provides stronger evidence that the postulated adrenergic-serotonergic interaction is of physiologic significance.

Adrenergic Sedation and Waking

Sedation was produced during the first few days of AMPT administration and high dosages of L–DOPA increased waking. In addition, discontinuation of AMPT produced profound insomnia in three of the five patients. These results suggest a possible role for the adrenergic system in the sleep-waking (as opposed to the sleep-REM) cycle.

Sleep Studies for Clinical Psychiatry

The evidence presented here that serotonergic and adrenergic systems interact in man to promote REM sleep has fascinating implications. Most psychiatric disorders are associated with abnormalites of sleep. Insomnia is one of the most pervasive and difficult to manage complaints that physicians encounter, and narcolepsy and hypersomnia are not uncommon. In addition, modern studies of depression and schizophrenia indicate that relatively specific sleep abnormalities are associated with these diseases.

Hypotheses relating abnormalities of serotonin and norepinephrine metabolism in both depression and schizophrenia are provocative and stimulating. One view is that depression is due to a functional deficit in norepinephrine at certain brain synapses. There is no direct evidence for this theory, but the finding presented here, that increasing brain catecholamines with L–DOPA reduces REM sleep, is consistent with the findings that drugs which are effective in treating depression (MAOI, tricyclics) also decrease REM sleep.

As inconsistency becomes apparent since REM sleep has generally been found to be low in depression. In order to explain this inconsistency, other possibilities can be explored. One such alternative is that the putative norepinephrine receptors are blocked in depressed patients and through a feedback mechanism, norepinephrine is quantitatively increased, producing a consequent decrease in REM sleep. The finding that some active chronic and acute schizophrenics, unlike most normals, do not have REM rebounds after being REM-deprived has renewed interest that schizophrenia might be associated with a functional deficit of serotonin. The findings presented here, that patients with PCPA-decreased serotonin concentrations had reduced REM sleep, increased NREM phasic events, and were without a postdrug REM rebound, support the possibility that there is a functional serotonin deficit in schizophrenia.

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REM Activity as a Correlate of Mood Changes Throughout the Night

David J. Kupfer and George R. Heninger

Since abnormalities of sleep are a prominent aspect of the depressive syndromes, it is important to assess how changes in sleep relate to the clinical course of the patient. If consistent relationships between the altered sleep patterns and depressive symptomatology can be found, this information will be relevant to an improved understanding of the psychobiological changes underlying the affective syndromes. In addition it is possible that assessment of initial and/or longitudinal changes in sleep pattern would be of clinical utility in terms of a method for classification of the type and severity of affective disorder or for evaluation of the clinical response to treatment.

Recently, it was suggested that the range of rapid eye movement (REM) sleep percentages among psychotic depressives may be the most significant aspect of their electroencephalographic sleep records. Both this range and change of REM sleep in relation to the course of depressive illness might be explained on the basis of a REM deprivation and compensation model. However, a finer assessment of sleep and mood relationships would be obtained if some aspect of the REM phenomenon could be correlated with specific, more rapid alterations of mood in affective illness.

For the most part, sleep electroencephalographic studies in affective disorders have focused on the depressive and manic episode itself and there have been few reports on the process of "switch" between depression and mania or vice versa. This period of mood change might serve as a model for investigating the psychobiology of affective states.

In 1970 a patient with a 48-hour "manic-depressive cycle" was referred to our research group. This report deals with the electroencephalographic sleep aspects of a study of this patient who was investigated intensively.

A Longitudinal Study

The patient was a 70-year-old man with a 4-year history of a 48-hour cyclic change in mood. The cycle consisted of two 24-hour periods where one period was characterized by depressed mood, motor retardation, and social withdrawal. This was followed by a 24-hour period of mild elation, increased motor activity, and social involvement.

While he was on the research ward, behavioral data was collected continuously. The rating instruments consisted of a short clinical rating scale completed daily at 4-hour periods by nursing staff and a self-rating scale used during certain phases of the patient's hospitalization. The daily changes in the patient's symptomatology was largest on the nurses' ratings of depression, lack of subjective energy, social withdrawal, and motor retardation, all of which were highly intercorrelated.

Electroencephalogram, electrooculogram (EOG), and submental electromyogram (EMG) were obtained by continuous all-night recordings for four consecutive nights weekly for a total of 18 weeks. The only exception was the REM deprivation experiment.

Days marked by hypoactivity, withdrawal, and depressed mood are called a D-period. The period marked by increased motor and social activity and mild hypomanic mood is referred to as an M-period. Since the analysis of the sleep data revealed consistent changes every other night, a similar convention was adopted for the nights of sleep. Only the changes in sleep during the control period are described here.

REM and Mood Changes

The major differences between the two types of nights (D and M) were more early morning awakening and less REM activity on D nights. This difference in REM activity is further reflected in the significant decrease in REM index (ratio of REM activity to REM time) on the D nights of sleep.

The results of the M-D partition suggested that significant mood correlations might exist for particular sleep variables at different times of the night. Since the data strongly suggest that REM sleep may reflect alterations of mood and this patient's greatest change in mood occurred during the night, there arose a unique opportunity to evaluate the possibility that mood changes occurring throughout the night are also reflected in REM changes occurring throughout the night. Changes of REM activity throughout the night coincided with an alteration in mood. The shifts to an elevated mood are accompanied by increased REM activity the second half of the night while the shifts to depressed mood are associated with decreased REM activity the second half of the night.

To understand more precisely the relationship of sleep changes to shifts in mood, each of the 14 control nights was divided into thirds and then analyzed by the M and D partition. Compared to the M nights, total sleep time was significantly greater in the D nights for the first two thirds of the night and drastically curtailed that last third. During the last third of the D night, each sleep parameter was significantly reduced.

Since certain of the REM measures indicated such high correlation with mood changes, it was decided to deprive the patient of REM sleep both to determine whether the mood changes would occur despite the REM sleep manipulation and to ascertain the extent of the REM rebound effect. Because of the patient's advanced age, the following protocol was utilized: He was first REM deprived on a night where he was alternating from a depressed to a hypomanic day (M night); then he was allowed one night of recovery; followed by two consecutive nights of REM deprivation and completed by two nights of recovery. The patient's sleep did not show any pronounced REM rebound on either of the two times he was REM deprived. That there were less awakenings on the second night of the consecutive REM deprivation procedure suggests that there may be a difference in REM "pressure" on D nights of sleep. No change in the patient's mood cycle occurred during or following this 6-day period.

Suggestions for Further Research

The regularity and magnitude of changes in symptomatology of this patient allowed us to document significant relationships between changes in mood occurring throughout the night and concomitant changes in sleep pattern occurring at the same time. These observations suggest an important line of research for investi-

gating sleep patterns in affective disorders and indicate that depressed mood can be related to particular sleep alterations. Furthermore, hourly REM activity mood relationships point out that changes in the all-night sleep pattern may be viewed as a dynamic process which may reflect changes in mood throughout the night.

The changes in REM activity and its correlation to mood could be a reflection of the cyclicity and not characteristic of depression in general. However, if the hourly changes in REM activity can be shown to correlate either to depressed periods or nondepressed periods separately, then the argument for the generalization of this finding would be strengthened. Indeed, while the extent of depressed mood was inversely correlated to the amount of REM activity during D-periods, the extent of mood elevation was positively correlated to the amount of REM activity during D-periods.

The possibility should be raised that changes in REM activity are associated with significant changes in clinical condition, rather than being a reflection of the clinical state per se.

Further analysis of this case, as well as less unusual cases, will be necessary to validate the notion of REM activity as a correlate of mood changes. In general, this case probably presents a model for a depressive episode which lifts every 24 hours rather than for bipolar illness with a manic and a depressed phase associated with hypersomnia. While the behavioral data showed a periodicity in mood change, a much greater degree of depression was present on the depressed days than mania on the manic days. In this case, early morning awakening, a feature prominent in many clinical descriptions of depression was correlated to depressed mood in the morning. Both the result of the M-D partition and the correlation between mood and sleep point up that early morning awakening and decreased REM activity may be characteristic features of unipolar depression at any age. That the most characteristic sleep changes in depression occur in the final third of the night is supported by the findings from dividing the night into thirds in which both nonrapid eye movements (NREM) and REM sleep are affected.

The night of sleep before an M-day during the control period appeared consistent with "recovery" or "improved phase" sleep in unipolar depression with features such as relatively little early morning awakening, and "normal" REM time and activity throughout the night. Nevertheless, in a person 70 years of age, it may be difficult to distinguish sleep during depression from "normal" sleep.

Finally, it is important to note that few sleep variables were significantly different in the M- and D-periods. In particular, the data on delta-sleep did not correlate with changes in mood during the control period. In fact, little delta-sleep was present, which might have been due either to his age or the lack of sustained improvement in his depression. It also may be that delta-sleep shows gradual changes throughout recovery phases while certain REM measures may be more responsive to rapid changes in mood.

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Synchronization of Augmented Luteinizing Hormone Secretion with Sleep During Puberty

Robert Boyar, Jordan Finkelstein, Howard Roffwarg, Sheldon Kapen, Elliot Weitzman, and Leon Hellman

The recent demonstration that the total daily production of cortisol occurs in discrete secretory episodes prompted evaluation of other hormones. Several investigators have reported that luteinizing hormone (LH) secretion in women and men is characterized by abrupt increases in LH concentration followed by slower declines that approximate the half-life of LH.

In view of these findings, the 24-hour LH secretory pattern in children and adolescents was studied before and during sexual maturation to clarify the sequential hormonal changes associated with the initiation and progression of puberty.

The subjects were nine boys and five girls, 5–16 years old. The five adult men were 22 to 40 years old. All subjects were hospitalized in a light-proofed and sound-proofed room and were adapted to the sleep laboratory for at least 24 hours before the 24-hour, 20-minute interval blood-sampling study. On the morning of the blood study, a catheter was inserted into an antecubital vein and attached to a longer connecting tube which extended into an adjoining room. This made it possible to obtain blood samples around the clock without disturbing the subject. During all sleep periods, including the delayed sleep-onset study, the subject slept with scalp electroencephalogram, electrooculogram, and electromyogram electrodes.

Mean LH Concentration During Sleep and Awake Periods

In the four preadolescent children, there was no significant difference between the mean LH concentrations asleep and awake. In all seven early pubertal subjects, the mean sleep LH concentration was significantly greater than the mean awake LH concentration. Except for one subject, the mean awake LH concentrations were not significantly different from the prepubertal LH concentrations. In the three subjects in late puberty, daytime waking LH secretory episodes began to occur, resulting in a mean LH concentration in the adult range; however, there was still a significantly higher mean LH concentration during sleep. Only one of the five adult men showed a significantly higher mean LH concentration during sleep.

Intermittent LH Secretory Activity

The LH secretory patterns during sleep were characterized by regularly occuring secretory episodes with a periodicity of 70 to 90 minutes. No such regularity was noted during the awake period in this or any of the other early pubertal subjects. The data clearly show the enhanced secretion of LH associated with sleep. This augmentation of LH secretory activity associated with sleep was not found in prepubertal children, normal adult men or, in an earlier study, in women during menstruation.

Association of Augmented LH Secretion with Sleep

In one subject, a delayed sleep-onset study was done to establish precisely the association of LH secretion with sleep during adolescence. The

augmentation of LH secretion with actual sleep was clearly demonstrated as against the possibility of a circadian rhythm that is not immediately linked to sleep. The mean LH concentrations during sleep and awake periods were similar to those found in this subject's control 24-hour study. This effect was not due to darkness since blindfolding this subject while he was awake failed to cause increased LH secretion.

A natural experiment of the relation of increased LH secretion to sleep occurred in a few of the subjects during periods of spontaneous arousal during the nocturnal sleep period. During these periods, the peak of an LH secretory episode was truncated, or the initiation of a secretory episode was delayed until the resumption of sleep. It is of interest that the LH secretory episodes between 10 p.m. and 4 a.m. in the delayed sleep-onset study were of greater magnitude and more regular than the LH secretory episodes during this subject's normal awake period. When a comparison was made with the 6-hour period before onset of sleep in this subject's control study a similar regularity was found, indicating, perhaps, a progressive buildup in LH secretory activity before onset of sleep.

Further studies using delayed sleep onset, sleep reversal, and short multiple sleep periods throughout the 24-hour period will be required to characterize this phenomenon more accurately. The sleep-associated increase in LH secretion, as well as sleep-associated growth-hormone secretion, shifts immediately with sleep irrespective of when sleep occurs. This phenomenon is in contrast to the cortisol secretory program, which remains unchanged for several weeks despite a 180° shift in the sleep-wake cycle.

Periodicity of LH Secretory Activity During Sleep

In all pubertal subjects there was a general relation between the number of LH secretory episodes occurring during sleep and the number of sleep cycles. The LH secretory episode interval is similar to the periodicity of the NREM-REM sleep cycle. LH secretion was almost uniformly initiated during NREM sleep. The point of termination of LH secretory episodes occurred in close proximity to or during REM sleep. These data suggest that REM sleep and wakefulness are associated with either a decrease or a cessation of LH secretory activity.

The association of increased LH secretion with sleep is consistently present only during adolescence. Before the initiation and after the completion of sexual maturation there is no consistent, significant augmentation of LH secretion during sleep. In later stages of puberty the mean daytime, awake LH concentrations are increasing, and there is less distinction between the sleep and awake mean LH concentrations. Since this increase in LH secretion associated with sleep was found only during puberty, consideration must be given to the importance of this phenomenon in the initiation of puberty.

The finding of a similar periodicity between LH secretory activity during sleep and the recurrent REM-NREM sleep cycle suggests some interrelation between these events; it remains to be established whether they are activated by a common mechanism.

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Hypnotic Suggestions for Learning During Stage I REM Sleep

Leslie M. Cooper and J. Hoskovec

Interest in laboratory investigations of sleep learning in the 1940's and 50's in the United States subsided in the early 60's, but has since become a subject of greater interest. Research is now incorporating the advances in the understanding of sleep and dreaming made over the last decade.

Reviews of sleep learning have been made with the general conclusions being pessimistic. Investigations of sleep learning (hypnopedia) in the Soviet Union have not, generally, taken account of developments in the West in regard to sleep and dreaming, and have found different results. The general conclusion of Soviet experiments is that learning during sleep is possible in highly hypnotizable or suggestible subjects in which a suggested set to perceive and remember is given.

Recent studies in the United States have demonstrated the acquisition during sleep of both reflexive motor behavior and cognitively meaningful material. In at least three of the studies the material could not be reproduced after subject was awakened, but could be elicited during a subsequent Stage I sleep period. This paradoxical finding may be the result of failing to establish in the subject an appropriate set for learning and remembering, prior to his falling asleep. Our study was an attempt to incorporate this factor by means of hypnosis in an investigation of learning during sleep.

The 11 subjects ranged in age from 16 to 21. All had been administered at least three standardized hypnotic susceptibility scales, and been selected because of their high hypnotic susceptibility. Each subject was interviewed to evaluate his appropriateness for inclusion in accordance with predetermined criteria including such information as frequency and ease of remembering dreams, knowledge of the Russian language, and previous attempts to learn during sleep.

The design required subjects to sleep in the laboratory for two successive nights, and each subject was paid $24 for his participation in the experiment. The experimental setting consisted of two rooms, one equipped with a comfortable bed and a place to hang clothing, and an adjoining room in which polygraphs and other apparatus were located. A window between the two rooms permitted the experimenters to observe the subjects.

EEG was taken bipolarly from three Grass silver disc electrodes: one over the vertex, one over the right occipital area, and one over the right frontal area. Eye movements were measured by the use of miniature strain gauges. Electromyography was obtained through two Grass silver disc electrodes applied to the chin with plastic tape. Breathing rate was taken by a pulse-wave attachment pneumograph.

Learning Task

One-syllable English nouns were selected according to a classification indicating the occurrence of at least 50, and not more than 100, words per million. Russian equivalents, each having two syllables, were used. The 10 pairs for each session (and the accompanying instructions) were tape-recorded

at equal loudness, and presented over a loud speaker. The words were presented in eight randomly ordered series making a total of 80 word-pair presentations.

Adaptation Night

The subjects arrived between 10:00 and 11:30 p.m. The electrodes and other measuring instruments were attached, and the subjects were told to sleep quietly. The subjects were instructed to press a button if they awakened. No records were made, but from the subjects point of view, both the physical setting and equipment were the same as on the experimental night. All subjects were awakened between 5:30–7:45 A.M. and sat in a chair for 5 minutes after being awakened.

They were then told,

You will find that you can easily remember everything that is said to you. You will hear some Russian words and their English translation. You will remember them easily, and they will later be available to you whenever you wish to repeat them. You will clearly hear the words and associate the English equivalents with the Russian words. The association will be so clearly established that you will have to exert no effort to remember what the Russian words mean in English. The Russian words will be clearly associated with their English translation and you will remember them. You will find that when you are asked to repeat them, the words will come into your awareness and you will be able to repeat the associations very easily. Now you will be alert and in your normal state of waking vigilance. You will clearly remember the Russian words and their English equivalents, and you will be able to report them.

Taped instructions were then played.

You will now hear clearly the Russian words and their English translation. Listen carefully and remember them. Remember them very well, including the accents. You will remember them your whole life. And you will be able to say the Russian words and their English translation whenever you wish. Listen and remember.

The control set of words was then presented:

You have heard and memorized the Russian words and their English translations. You have memorized them successfully so that you will remember them very easily. You will be able to say them at any time. You will clearly remember hearing the Russian words and their English translations, and you will be able to repeat them when you are asked to do so. Five minutes after the termination of the administration of the words, the subjects were asked to give the English equivalents to each of the Russian words.

Experimental Night

The procedure was the same as on the previous night to the point following the attaching of the electrodes and other measuring instruments. The subjects were again asked to press the button if they awakened. A Subjective State Scale was utilized to determine the depth of hypnosis. This had been explained to the subject:

It is helpful for us to know how deeply a subject feels that he is hypnotized. In order for you to do this, I want you to make use of a rating scale. Think of a scale, using the numbers from 0 to 10 inclusive. Zero will be defined as the way you feel in your normal waking state, when you are wide-awake and alert. Ten will represent the deepest hypnosis that you can imagine, and five is the average depth that most very good subjects experience in our experiments here in the lab. From time to time, I will ask you your state, or how deeply hypnotized you feel you are, and when I do, I would like you to respond with a number 0 to 10 which corresponds to how deeply you feel you are hypnotized. We have found that our subjects can do this quite easily and accurately, and it is very useful to us. Do you understand? What is your state now?

With the subject lying in bed, hypnosis was induced using a modification of the standard induction procedure

in the Stanford Hypnotic Susceptibility Scale, Form A. If necessary, deepening techniques were utilized until the hypnotic depth reported was at least six.

The set to perceive and remember the material was given:

> You will remain hypnotized as you go to sleep this night. You will not be aroused from hypnosis before falling asleep, but you will feel drowsy and sleepy and will remain hypnotized as you go to sleep. After you fall asleep, we will talk to you again from time to time. You will be able to hear our voices and clearly understand what we say to you, but you will not awaken from your sleep, nor will you be aroused from hypnosis. You will find that you will be able to hear in your sleep, and this will seem natural and not disturb you. During your sleep, we shall speak to you, and you will hear and understand what is said to you. You will find that as a result of this special condition, you can easily remember everything that is said to you. You will hear some Russian words and their English translations. You will remember them easily, and they will later be available to you whenever you wish to repeat them. Of course, you will sleep all the time, not awakening, but in your sleep you will clearly hear the words and associate the English equivalents with the Russian words. The association will be so clearly established that you will have to exert no effort to remember what the Russian words mean in English. The Russian words will be clearly associated with their English translations, and you will remember them. You will find that when you are asked to repeat them, the words will come into your awareness and you will be able to repeat the associations very easily. You will remain deeply hypnotized until you will be awakened from sleep. When you awaken from sleep you will also awaken from hypnosis so that you will be alert and in your normal state of waking vigilance. When you awaken, you will clearly remember the Russian words and their English equivalents, and you will be able to repeat them.

The subject had been instructed to press a button if he awakened. but this was not the only or most important criterion of sleep. The discrimination between sleep and wakefulness was based on the general behavioral appearances of the subject observed by the experimenters, the monitoring of physiological responses, the subjective post hoc report of the subject about his impression of being asleep, and the failure to press the button.

When a visual determination of emergent Stage I REM sleep was made, taped instructions were presented:

> Now your breathing is becoming deeper and deeper, deeper and deeper.

This instruction was utilized before and after the administration of any words, and the appropriate changes in breathing rate were utilized as an overt indication of the registration of the verbal instruction while subject was asleep. Only after a change in breathing occurred were the taped instructions continued:

> Continue to relax. I am going to talk to you again but you will remain relaxed. You are sleeping quitely. Sleep and do not awaken. You will be able to hear me clearly and understand what I say without awakening. You are resting well and will continue to do so. Your breathing is even and slow . . . . Now your breathing is becoming deeper and deeper, deeper and deeper . . . . You will now hear clearly the Russian words and their English translations. Listen carefully and remember them. Remember them very well, including the accents. You will remember them your whole life. And you will be able to say the Russian words and their English translation whenever you wish. Listen and remember.

The experimental set of words was administered, followed by the suggestions:

> You have heard and memorized the Russian words and their English translations. You have memorized them successfully so that you will remember them easily. You

will be able to say them at any time. You will clearly remember hearing the Russian words and their English translations, and you will be able to repeat them when you are asked to do so. And now continue to sleep. Continue to sleep but listen to me. You are sleeping quietly. Your breathing is even and slow . . . . And now your breathing is becoming deeper and deeper, deeper and deeper . . . .

If at any time during the presentation of the instructions or the words the subjects appeared to be awakening or entering a different stage of sleep, the taped presentation was terminated and not resumed until the next determination of Stage I REM sleep was made.

Immediately following the administration of the words, the subjects were awakened and after 5 minutes, were tested for their learning of the Russian-English pairs. The subjects were then permitted to sleep again.

It was anticipated that because the words would be learned in a stage different from the normal waking state, the subjects might hesitate to report the words though the input was completed. An attempt was made to permit the subjects to report their impressions, even though under a low level of subjective confidence, by telling them, after a first testing of the words (free recall condition) was completed:

Sometimes we have a fleeting impression of something but we are not confident enough to comfortably report it. This time, please tell me the word that comes into your mind, if any, when I pronounce the Russian words. Guess if necessary. Do not feel that you have to be certain of a word to report it.

This was called the "guessing recall" condition. Finally the subject was told, as the experimenter handed him a card listing the 10 English experimental words:

Now I shall give you a card with 10 English words printed on it. When I pronounce a Russian word I want you to select one of the English words which you feel is associated with it. Please guess if necessary but always select one.

This was called the "recognition" condition.

Learning Under the Control Condition

The number of word pairs correctly learned under the control condition (free recall) ranged from 6 to 10, the mean being 9.18. Since there were 10 word pairs presented, an average of 90 percent of the material was learned. This suggests that the material was of suitable difficulty for the subjects.

Learning Under the Experimental Condition

Free recall—The number of word pairs learned ranged from 0 to 9, with only two subjects learning more than four. The mean was 2.82. Approximately 30 percent was mastered under this condition.

Guessing recall—The number of word pairs recalled correctly again ranged from 0 to 9, with only two subjects learning more than five. The mean was 2.82, the same as under the free recall condition. The correlation of .98 between the number of words learned as tested under guessing recall and the free recall conditions implies that the subjective confidence of responding was of no importance.

Recognition—The number of word pairs correctly associated ranged from 0 to 10, with only two subjects responding correctly to more than five. Although the mean increased to 3.91, an analysis of the gains made by each individual revealed that they were not greater than those that could be expected by chance.

In summary, regardless of the conditions under which the experimental word pairs were tested, and when the

effects of chance were considered, the amount learned while asleep was no more than one third of that learned while awake.

Suggestions for Further Research

Further research might utilize other states of sleep. There are few investigations which have examined the possibility of changing an ongoing stage of sleep by the input of some stimulus. In trying various procedures to be utilized in this study, the material was presented in Stage IV sleep and it appeared that this stage changed to Stage I REM sleep. Further experimentation must be completed before pursuing this line of research.

Three subjects were run to establish procedures which would maximize the amount learned under sleep. For these subjects the material was not tested until the following morning. Two subjects could not respond correctly to any words. The third subject correctly responded to nine words but stated that he had awakened shortly after the presentation of the words and practiced them. Consequently, it was decided to test immediately after the presentation of the words as there may be loss if the testing of the words was postponed until the following morning. In the Russian studies the material was presented just before waking up in the morning. It is at this time that the periods of Stage I REM sleep would be prolonged. The procedure utilized which would capitalize on these factors may account, in part, for the success of these studies.

A subject's inability to respond with the correct word may be due to a problem either of registration or retrieval. In this study hypnotic suggestions were given to perceive and remember the words. In addition, changes in breathing rate were elicited by suggestion. This suggestion was an atempt to insure that the subject was perceiving the material. However, it would be more satisfactory if the subject could respond in some manner throughout the presentation of the material. This might be accomplished by using subjects who talk in their sleep and giving them a hypnotic suggestion that they will repeat every word as it presented during the sleep.

Because of the complex processes which sleep learning requires, special training should also prove useful. Exposing subjects to autogenic training prior to the sleep learning should improve the possibility of learning during sleep, for example. Some subjects in this study were anxious, apprehensive, and, in at least one case, rather disturbed by the procedures of sleep learning. Previous training should eliminate such reactions.

The importance of suggesting a psychological set to perceive and remember has been emphasized as accounting for the learning which did occur in sleep, even though it is less than that which occurred in the waking state. This is consistent with the Russian findings. However, it is necessary to separate the effects of the suggestions for the set from the effects of hypnosis.

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The Relationship of the Manifest Content of Dreams to Duration of Childbirth in Primiparae

Carolyn Winget and Frederic T. Kapp

The influence of psychological factors on labor has been investigated by obstetricians, psychologists, and psychiatrists for many years. Fears and anxieties about delivery and the role of motherhood have been considered contributing causes in prolonged labor in which mechanical or medical reasons are absent.

The assessment of the role of psychic conflict in childbirth is complicated because denial and repression are defense mechanisms used frequently by pregnant women to avoid facing their fears and anxieties. The expectant mother's attitude toward her coming infant, her readiness for motherhood, her changing self-image, and her whole life situation contribute to the psychic influences on her delivery. Expectations and fears of childbirth are intensified with the beginning of labor, and existing psychic conflicts are often reactivated.

Why does the pregnant uterus, after remaining for months subject only to minor and occasional contractions, suddenly go into powerful and efficient action which within a few hours rids the uterus of the contents which it has borne for such a long time? We do not have a clear answer to this question. A role in the onset of labor is undoubtedly played by maturing physiology of the fetus as well as that of the mother. The uterine musculature is sensitive to the intricate balance between the hormones of the fetus and those of the mother. The series of events that culminates in labor involves, and may be triggered by the maturation of the fetal endocrine system, particularly the pituitary and adrenal glands. The various secretions of these glands affect the physiology of the mother via the placenta. A feedback mechanism probably initiates labor by affecting the hormonal production of the placenta as well as the maternal endocrine glands which in turn affect the uterus directly.

The purpose of this paper is to report on some dimensions of the manifest dream content in pregnant women, as well as to describe some interesting relationships which have emerged between types of dream content and subsequent duration of labor in primiparae. One hundred successive, presumably healthy, primigravidae were selected, but 30 were later excluded for various reasons.

Each subject was given a semi-structured interview attempting to discover her attitudes toward variables thought to be central to adaptation to pregnancy and motherhood. A request for the most recent dream was made within the context of sleep difficulties.

Assessment of Length of Childbirth

Contrary to our expectation that length of labor would provide the "hard" data of this study, we found that much effort was required to approach a valid and reliable assessment of this variable. It was found most useful to take into account the sum of three phases of childbirth: The "Latent Phase of Stage One of Labor," defined as beginning with the onset of regular uterine contractions, as perceived by the subject, and extending to that point when cervical dilatation suddenly accelerates; the "Active Phase of Stage One of Labor," which extends from the time of acceleration to full dilatation of the

cervix; the "Second Stage of Labor," defined as the period from the end of the active phase to the delivery of the infant.

Relation of Dreams to Duration of Labor

The 70 women were divided into three categories on the basis of total childbirth time. Group I was 31 women who delivered in less than 10 hours; Group II was 31 women whose childbirth time ranged from over 10 to 20 hours; Group III was eight women whose childbirth time was over 20 hours. Race, marital status, and age were not significant factors in the distribution of the subjects among the three groups. Nor did whether or not a subject told a dream during the interview relate to subsequent length of labor.

Results of the analysis of the manifest dream content for the three groups indicate:

- There was a significant relationship between frequency of dreams with anxiety in the manifest content and duration of childbirth. Anxiety was present in over 80 percent of the dream reports of those who delivered in less than 10 hours but in only 25 percent of the dreams of the prolonged labor group. The women who were intermediate in frequency of anxiety themes were also intermediate in length and labor.
- Scoring for themes of threat revealed similar differences. The vector of the threat, i.e., whether it was directed toward the self or toward another object, did not differentiate the dreams of the three groups.
- Hostility, both that directed outward and to the self, showed trends toward being highest in those women with the shortest labor time as compared with the intermediate and prolonged labor groups.
- Average motility scores suggested that the higher the movement scores in dreams, the shorter the labor time, although this finding was not statistically significant.
- Overt themes of babies, labor, and delivery room were present in about one-third of the dreams of all the subjects but did not differentiate the short, intermediate, and long labor groups.

Possible Function of the Dream

The physiology of the pregnant woman is designed to nurture the growing fetus and is tuned to a serene contented waiting. Even women who are usually tense are often surprised by their calmness during pregnancy. To this physiologically determined self-satisfied state is added the indulgence of the culture which allows and encourages the self-centered attitude of the pregnant woman.

A woman's emotional state during pregnancy is determined by her physiological status as well as her personality structure, and only secondarily is it influenced by personal attitudes toward external factors such as the legitimacy of her pregnancy. We found no differences in duration of childbirth by marital status.

An important psychic task of the pregnant woman is to differentiate the fetus from herself so that when delivery occurs she will accept the newborn infant as a separate individual. To the extent that this differentiation is not worked through, the delivery will be a painful separation, as though a part of the body were being lost. An important task of the pregnant woman is to prepare to deliver the child from herself both physically and psychologically.

Most women pregnant for the first time anticipate the coming childbirth as a major crisis. Yet concern about childbirth remains in the background

during the contented, hormonally well-balanced pregnancy of those women who have a normal desire for motherhood. Toward the end of pregnancy, however, the contented mood is often dimmed by tense expectations, fear of pain, fear of being damaged or of dying, and concern for the well-being of the unborn child.

We found that pregnant women in whom anxiety and threat themes are missing from their dreams are more likely to undergo prolonged labor due to inefficient uterine action than their counterparts whose dreams contain anxiety and threat. This supports the hypothesis that the function of the dream is an attempt to master, in fantasy, an anticipated stress in waking life.

We think that the attempt to solve an intense ongoing conflict in the dream utilizes techniques successful in dealing with previously stressful situations. Dreams characteristically contain elements representing current or anticipated problems as well as representations of earlier conflicts. This intermingling of the current problem which the dreamer is attempting to solve with those conflicts successfully coped with in the past is used by the dreamer as a kind of template to work out a solution. The blending of past and present often represented in the dream by metaphor or analogy, frequently gives the dream its seemingly meaningless or bizarre manifest content.

Our study suggests that pregnant women who dream of stressful themes or feelings of anxiety and other negative affects are attempting to cope with the anticipated crisis of the delivery. Those women who do not face the coming stressful situation by attempting to deal with it in their dreams are more likely to resort to mechanisms of denial and repression of the anticipated threat. There was a marked tendency for those who subsequently underwent prolonged childbirth to report briefer dreams than their counterparts in both the short and intermediate duration groups. We hypothesize that for some women the anticipated trauma of childbirth is too great to be allowed even symbolic or displaced expression in dreams. When labor is initiated, their lack of psychological preparation, as evidenced by the absence of anxiety and threat in their dreams before labor ensues, may lead to increased anxiety with its concomitant abnormalities in catecholamine blood levels.

Dream reports during pregnancy provide a useful clinical research tool for circumventing the defenses of denial and repression and can lead to a better understanding of the underlying dynamics of how a woman copes with the crisis of childbirth. For some women, even though there is little conscious awareness of the nature of the imminent stress of childbirth, dreaming can function to mobilize and integrate adaptive mechanisms and thus perform a major function in coping with one of the important stresses in a woman's life.

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Examination Dreams in Nigeria: A Sociological Study

Peter P. Ekeh

Although interest in examination dreams is as old as psychoanalysis itself, their study has been restricted to the psychiatric clinic. In view of the importance of examinations in modern cultures, including those in Africa and Asia newly exposed to literacy, and in view of the significance of examination dreams as an expression of anxiety, it would seem appropriate to involve other social science perspectives in their study. Even if anxieties associated with examination dreams are individual experiences, they appear to be closely linked up with social patterns. The purpose of this paper is to offer sociological interpretations to three hypotheses on examination dreams, and to test them with data available from Nigeria, a nation where formal, Western-type examinations are new.

The Hypotheses

Insofar as the discussions of examination dreams have been stated in testable forms, three hypotheses seem relevant for their sociological investigation. The first two originate from psychoanalytic interests while the third originates from cultural anthropological interests in the phenomenon of examination dreams.

The academic performance hypotheses—Freud's explanations of examination dreams fluctuated between treating them as punishments and seeing them as dreams with a consolation function—that is, as dreams that deal with anxiety that has been displaced from some other source to the examination.

To the extent that there is a difference between high and low academic performers in the tendency to manifest anxiety in certain ways, Freud's consolation function hypothesis would lead one to expect that those who perform well in examinations will more often show anxiety by dreaming of past examinations than will poor academic performers. This sociological generalization does not concern itself with the total amount or degree of anxiety with reference to academic performance; it implies that poor performers may manifest their anxieties in ways other than examination dreams. Nor does it argue that examinations are the only past experiences that high academic performers resort to in dreams when confronted with frustrating circumstances. It does mean that when high performers are matched with low performers in anxiety-rousing situations, the former will dream more about examinations than will low academic performers. It would seem permissible to broaden this psychoanalytic consolation function interpretation into a sociological hypothesis as follows: There is a positive relationship between academic performance and the prevalence of examination dreams in any population—the higher an individual's academic performance the greater the tendency to dream about examinations.

The social mobility hypothesis—More common in the psychoanalytic literature is a hypothesis that links examination dreams with oedipal situations and guilt feelings originating from oedipal conflicts. This hypothesis seems to have some relationship to social mobility, in that in some instances oedipal guilt is aggravated when the son attempts to rise above his parents socially.

Although psychoanalytic concerns are with individuals and the conflicts are intrapsychic, sociologists and social psychologists have discerned relationships between such conflicts and patterns of anxiety closely associated with social mobility.

According to this view, examinations should be especially traumatic for those in the lower rungs of society struggling to climb beyond the positions attained by their parents. Hence this hypothesis is translatable into social mobility terms: Those individuals in society who gain greater upward social mobility as a result of education and examinations will tend more frequently to experience examination dreams than other individuals who have less to gain by way of upward social mobility as a result of education and examinations.

The cultural salience of examinations hypothesis—Closely linked with this social mobility perspective is an anthropological emphasis that relates the prevalence of examination dreams to the value attached to examinations in any given culture.

According to this view, one should expect examination dreams to be prevalent in those societies where examinations are socially salient. (One extension of this view would be the expectation that Europeans, with the usual experiences of one-shot, make-or-break examinations, will tend to experience more examination dreams than Americans, who lack such experiences.) The hypothesis expands the previous hypothesis, predicting that the salience of the examination in the society—as well as its importance to any particular individual—will influence the prevalence of the examination dream. The hypothesis can be stated as: Those sections of society that rely most directly on examinations for social mobility will experience examination dreams more commonly than those sections which rely least on examinations for social mobility.

The Hypothesis In A Nigerian Context

Because Nigerian society and cultures are somewhat alien to the Western world, it would seem important to interpret these hypotheses in terms of their Nigerian forms. The academic performance hypothesis, derived from Freud's consolation function hypothesis, is the boldest and the most universally applicable of the three hypotheses. To the extent that it has any validity, one would expect it to show up in a Nigerian study. The social mobility hypothesis is also applicable to the Nigerian situation, where social mobility has been high and where the democratic nature of the educational system has placed peasants' children into the same competitive position as the children of men who have been highly educated in Western institutions.

The hypothesis involving the cultural salience of examinations requires some extended interpretation in the Nigerian context. Although education has been important as an avenue for upward social mobility in Nigeria, it has not been uniformly so for all ethnic groups. There are two main avenues for social mobility in Nigeria—the traditional and the modernized. Traditional sources of social mobility—e.g., via chieftaincy—exist in some ethnic groups. In other ethnic groups, traditional avenues for social mobility no longer exist, and social mobility is achieved through modernized resources, largely obtainable from schools. In between these two positions are other ethnic groups in which the traditional and modernized avenues are merged into one broad road upward.

The three ethnic groups in this study typify these patterns of social mobility. Hausa-Fulani society resisted British colonial influence and managed to preserve many of its traditional attributes. On the other hand, the heavy reliance of Ibos on Western education for social mobility has become proverbial. In between, the Yoruba have combined the traditional and the new; Yorubas climb upward either through Western or traditional means.

In summary, for the Hausa-Fulani, Western education was neither necessary nor sufficient for social mobility, although it could be an important contingent factor. For the Ibos, Western education was both necessary and sufficient for social mobility. For the Yoruba, Western education was a sufficient factor, but it was by no means necessary. The hypothesis regarding cultural salience, therefore, leads one to expect a greater frequency of examination dreams among the Ibo subjects than among the Yoruba, and among the Yoruba subjects than among the Hausa.

The Data

The principal data consist of 345 dreams collected as "most recent dreams" by Professor Robert A. Le Vine of the University of Chicago, from Nigerian postsecondary school and final-year secondary school students in Nigeria in 1962. The dreams were collected for a study of social mobility patterns among the three largest ethnic groups in Nigeria. For the purposes of this paper the dependent variable is the presence or absence of examinations in reported dreams. The independent variables are parental education and occupation ethnicity, grade placement (i.e., secondary or postsecondary), and academic performance of secondary school subjects in the West African School Certificate Examinations and academic performance of postsecondary school subjects in the Cambridge (England) Higher School Certificate Examinations. All subjects are male.

Ethnicity, referring to Hausa, Ibo, and Yoruba subjects, will be the basis for testing the cultural salience of examination hypothesis and it will be controlled in testing the other two hypotheses.

From parents' educational levels and types of occupations, I built a composite Index of Parental Modernity (IPM). Low scores represent a greater distance from modernity than high scores. This will be the basis for testing the social mobility hypothesis.

In the West African School Certificate Examinations, results have a built-in composite index of academic performance—the pooled scores of candidates in their best six subjects. The examiners used these aggregate scores for categorizing the candidates—the best passing performances in Division I and the worst passing performances in Division III. Candidates who were not in any of these three Divisions failed. For this analysis, the subjects whose aggregate scores placed them in the two highest Divisons (I and II) have been assigned to "high academic performance"; and those in-between (Division III) to "marginal academic performance." I attempted the same grouping for the postsecondary school subjects by aggregating their best three subjects in the Cambridge (England) Higher School Certificate Examinations results. These aggregate scores formed the basis for testing the academic performance hypothesis.

The students were asked in a classroom setting "to spend half an hour writing in English a description of the most recent nighttime dream [they]

had had." The time limitation and the presence of a researcher may have been significant factors for the test situation—although the researcher's foreign and white background have little effect in a secondary school system in which European teachers are commonplace. The subjects were quite fluent in English. However, English is a foreign language for all of them—at least, it is not a childhood language. Since the same testing method was used in all seven schools, a reasonable assumption is that the effects of these factors were sufficiently randomized.

Findings

The culture salience of examinations hypothesis—The direction predicted for the hypothesis is maintained. Ibo subjects, with 27.9 percent, are most likely to dream about examinations, followed by the Yoruba with 12.1 percent, and the Hausa with 7.7 percent.

"Publication" of examination results is of major significance for the examination mystique in Nigeria. Secondary school certificate examination results are published in national and regional newspapers. Some candidates learn of their performance, usually after 3-months, in these newspapers. Friends and relatives, especially those away from home, rely on these publications to learn about the candidates' rites-de-passage performances, so to speak, in these examinations. It is problematical whether in the Nigerian context the examination itself is more anxiety-arousing than the publication of the results.

The social mobility hypothesis—According to the hypothesis, we should expect an inverse relationship between IPM and the frequency of examination dreams—the higher the IPM scores the lower the percentage of examination dreams reported. The social mobility hypothesis does not receive any support. Even when IPM is replaced by separate tabulations of fathers' and mothers' education and occupation, the same inconclusive results remain.

It may well be that if the hypothesis does have any validity, it is among neurotic patients rather than among normal subjects. However, my suspicions are that the lack of relationship may be due to a feature of the stratification system in Nigeria. In the West the social stratification system allots prestige to individuals on a unitary basis. In Nigeria, as in many formerly colonized nations of Africa and Asia, the stratification system operates on a dual basis. The traditional stratification system is important in many phases of life, particularly for the older generation with no Western-type education. However, the traditional system is not considered as lower or higher than, but rather as different from, the modern stratification system based on Western education. Indeed, most educated young people at the secondary school level seem to be able to participate in both stratification systems with ease. Hence the anxieties associated in the West with climbing higher in the stratification system may be lessened in social mobility patterns in Nigeria. If this interpretation is correct, then one may still find in research on examination dreams in the West that the hypothesis can be supported.

The academic performance hypothesis—The results reveal an intriguing reversal of the academic performance hypothesis of examination dreams. Whereas the formulation of the hypothesis is in terms of a linear relationship, the results here indicate a curvilinear relationship between academic performance and the frequency of examination dreams. Those who

indicate most anxiety by dreaming about examinations are neither the good students nor the poor students; they are the marginal students. The consistency in this pattern for each ethnic group and for all groups together is remarkable.

It may be that the phenomenon of marginality is underplayed in social psychology. Standing in a position where they may move up or slip down the academic scale, marginal performers may experience greater anxiety than either the high performers or the poor students, who would be more certain of their prospects.

The effect of actual experience with examinations—The academic performance hypothesis has a retrospective character and would appear to have the following corollary: Those who have had actual experiences with examinations tend to dream more about examinations than those who have not had such experiences. In the Nigerian context this would refer to experiences with the School Certificate Examinations, which are the first major formal examinations taken in Nigeria. In my data this would mean that postsecondary subjects who had taken this examination would report more examination dreams than secondary school subjects who had yet to take the examination. A second corollary, particularly apparent in Freud's thought, would appear to be: Those who have had actual experiences with examinations dream more about real examinations they had taken in the past than about imaginary examinations; on the other hand those who have not had actual experiences with examinations tend to dream more about imaginary examinations than about real examinations. Both corollaries are borne out by the results. Past experiences with examinations lead to a greater frequency of examination dreams and to real, rather then imaginary, examination dreams.

The sociological generalization of psychoanalytic hypotheses on examination dreams may appear rather rash to purists in both fields. In the long run the value of such an exercise can only be tested by research. It is worth mentioning that of the two hypotheses derived from psychoanalytic theory, that of social mobility (via oedipal guilt) was not supported by the sociological data. While the hypothesis of academic performance did not turn out as predicted, it may be of interest to both psychoanalysis and sociology.

Perhaps the novel patterns of life in Nigerian schools may provide a good atmosphere for the joint exploitation of sociological and psychoanalytic perspectives on human behavior. Neither traditional sociological research tools nor the psychoanalytic concerns with intrapsychic conflicts may by themselves be able to reach the meaning of such novel problems as the "brain fag" phenomenon among Nigerian students.

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Can Calories Be Perceived and Do They Affect Hunger in Obese and Nonobese Humans?

O. W. Wooley, S. C. Wooley, and R. B. Dunhan

The assumption that the onset and intensity of hunger following a meal are directly related to the meal's caloric contents especially in persons of normal body weight, has gone largely untested and unproven. The purposes of the present experiment were as follows: To determine if and when subjects can, on the basis of metabolic cues alone, perceive an excess or deficit of calories above or below their usual caloric intake for a given meal; and to determine if subjects' feelings of hunger and satiety are affected by these manipulations of caloric content.

Because of the presumed etiological importance in obesity of the ability to perceive and correctly label metabolic events, both obese and nonbese subjects were used.

Subjects were given high-calorie and low-calorie meals, and required to identify them as such. In order to eliminate sensory cues, such as taste, texture, and appearance, and at the same time vary caloric density, two liquid diets were prepared, one high calorie, one low calorie. The major difference between the two diets was that the high-calorie food contained more carbohydrate. Th attempt was to make the diets identical in taste, texture, and appearance. If this attempt was successful, a subject should not be able to identify his meal (breakfast or lunch) as high calorie or low calorie immediately after drinking it, since at least some time is required for the food's calories to become available to the body. If there are recognizable satiety cues associated with the metabolism of the extra carbohydrate calories on high-calorie days and increased hunger associated with the lesser amount of metabolic activity on the low-calorie days, a subject should become increasingly more able to identify the caloric level as time passes, following their ingestion.

Fourteen subjects participated in the experiment; seven (four females, three males) were nonobese and seven (five females, two males) were obese. Six of the obese subjects had been obese since childhood; four of these were at, or near, their peak weight. Of the other two "juvenile obese" subjects, one had recently lost about 25 pounds, the other had been about 30 pounds heavier 5 years before. The one remaining obese subject had been underweight (by her own estimate) until, following a hysterectomy, she gained to her present weight.

All but one of the seven nonobese subjects were at, or near, their peak weights. Five of these six reported a history of stable body weight since adulthood; one had gained about 25 pounds since his marriage, but was still only 9 percent above ideal weight. The remaining nonobese subject had been overweight from age 10 to age 22 at which time he lost approximately 40 pounds.

All subjects were adults. The mean age for the nonobese subjects was 31; for the obese, 34.

Subjects were given a liquid meal at their regular breakfast or lunch time. During a baseline period of 5–10 days, the meal contained .82 calories/cc. During the experimental period of 14–21 days, half the meals contained 1.07 calories/cc. (high-calorie meals) and the other half .57 calories/cc. (low-calorie meals). Subjects were not told that half the meals would be high

and half would be low calorie; they were merely told that each meal would be either high or low calorie. The order in which the high- and low-calorie meals were given was randomized with the restriction that no subject receive meals of the same caloric density for more than 3 days in a row.

The volume of each subject's meals was determined so that, on the average, he received as many calories as he usually ate at the meal (breakfast or lunch) which the liquid meal replaced. (This determination was made on the basis of subject report; all the "breakfast subjects" reported that their breakfast seldom varied; the "lunch subjects" were required to record what they ate at lunch for 3 consecutive days.) Thus, the volume of each subject's meals, baseline and experimental, was always the same; the caloric density, and therefore the absolute number of calories consumed, varied.

After drinking each meal, each subject indicated whether he thought the meal was high calorie or low calorie. These judgments (hereafter called "caloric judgments") were made at the following intervals: immediately, 15 minutes, 30 minutes, 1 hour, and 2 hours after ingestion of the meal; just before and just after the next regular meal; and just before the next meal (the next day). Subjects also indicated on a 100-point scale how "confident" they were in the correctness of their caloric judgments. At the same time that they made caloric judgments, subjects indicated how hungry they felt by use of a 7-point hunger scale.

Accuracy of Judgment

Of the total of 262 caloric judgments made immediately after ingestion of the 262 experimental meals, 144 were correct. This above-chance level of accuracy was largely due to two subjects who were able to detect sensory differences in the diets, showing 75 percent accuracy in their initial judgments. The initial level of accuracy for the remaining subjects was only 51 percent.

The higher level of accuracy achieved on the high-calorie days is due to subjects' guessing strategies. Of the 262 initial judgments, 58 percent were "high." The obese subjects more often guessed "high" than did the nonobese.

Very little improvement in accuracy was shown by either group under either condition at the longer intervals. One hundred and fifty-seven of the 262 caloric judgments made just before the next regular meal were correct; an improvement of only 5 percent.

Very little difference was shown by the two weight groups. Both the nonobese and obese subjects were more accurate with the high-calorie meals; the obese exhibited this differential accuracy more than the nonobese did.

Most of the time subjects did not change their caloric judgments; once they decided that a meal was high or low calorie, they tended to stick with their initial judgments, regardless of whether these were correct or not. On only 45 experimental days was the initial caloric judgment changed. Of the 118 initially incorrect caloric judgments, only 29 were corrected. Sixteen of the 144 initially correct judgments were changed, yielding a net improvement of only 13 more hits at the "just before the next regular meal" interval than immediately after the ingestion of the experimental meal.

Hunger Ratings

Both the obese and nonobese reported greater hunger on the low-

calorie days than on the high at every interval. The nonobese reported greater hunger than the obese subjects at 1 and 2 hours after the experimental meal; and hunger ratings increased steadily up to the time of the next regular meal.

Confidence Ratings and Hunger Ratings on Days When Caloric Judgments Were Not Changed

On the overwhelming majority of the subject days, caloric judgments did not change, even though on 41 percent of these days, the judgments were wrong. By definition, the caloric judgments cannot reflect any effect of calories on these days, but two other variables—confidence ratings and hunger ratings—were examined to see if they were related to calories. Neither was.

Hunger Ratings on Days When Caloric Judgment Changed

Only four subjects changed their initial judgments more than three times. When the changes that were made are categorized into the four possible categories—i.e., judgment changed from high to low, correctly; from high to low, incorrectly; from low to high, correctly; from low to high, incorrectly—the number of subject days in each category is quite small: 16, 9, 13, and 7, respectively. Perhaps it is sufficient to note that when these 45 meals are considered jointly with the other 217 meals, caloric content is significantly related to hunger ratings. When the other 217 meals are considered separately, caloric content is *not* related to hunger ratings. So, it must have been on the remaining 45 days that caloric content had its effect on hunger ratings.

The caloric content of the meals had little effect on subjects' hunger. Incorrect judgments were seldom changed, and were made with as much confidence as correct ones. On days when the initial judgments remained unchanged—on 83 percent of all subject days—hunger was unrelated to the meal's actual caloric content, but highly related to its judged caloric content.

That the caloric judgments were so unsusceptible to change is surprising, and two explanations suggest themselves. One is that nothing, or not enough, happened to make them change. Perhaps the actual caloric content of a meal has little to do with its power to satiate in the short-term situation. Instead, hunger may depend more upon how much satisfaction is believed to be inherent in the latest meal.

Contrary to this explanation, two subjects showed some ability to discriminate high- and low-calorie meals, suggesting that at least some people sometimes perceive metabolic cues associated with the food they eat. These two subjects differed from the other subjects only in that they were both underweight during childhood and adolescence, and both gained a considerable amount of weight after reaching adulthood. How this difference related to their ability to perceive calories is not known.

The other explanation concerns the possibility that requirements of the task interfered with the potential effects of calories on hunger. People do not usually decide if their meal is high or low calorie; they eat until satisfied, then stop. The act of guessing the caloric value of their meals, and of repeatedly evaluating those guesses without feedback, may have blocked subjects' perception of the relevant internal metabolic events. Perhaps, under ordinary circumstances, those events do influence hunger, but the influence is not powerful enough

to persuade one to change an already made caloric judgment. Furthermore, a judgment that a meal is high or low calorie implies a higher or lower level of satisfaction. Such implications were present almost immediately after ingestion of the experimental meals, but are seldom present in everyday eating situations.

Features of the experiment suggesting that perception was not blocked by the requirements of the task include the following: Subjects were instructed to focus attention on how they felt at the time they made their caloric judgments, ignoring previous judgments, and were encouraged to change their guesses if they detected any contradictory signals. These instructions should have maximized the the probability of metabolic cues being perceived. Second, the actual caloric difference between the high- and low-calorie meals was considerable; they differed by a factor of almost two. Third, each subject received a considerable number of trials.

The last two features deserve special emphasis with respect to the issue under discussion. Both weigh heavily against the hypothesis that something akin to demand characteristics of the task determined the results. For this hypothesis implies that merely making a decision about a meal's caloric content could have an effect powerful enough to cancel out repeatedly what should, theoretically, be very strong signals.

The hypothesis favored by these results—that what is believed about a meal's caloric content is more important in the short-term situation than the meal's actual caloric content—is supported by other research. These studies, taken together with the results of the present study, constitute negative evidence. The hypothesis that an important difference between obese and nonobese persons is the greater ability of the latter to perceive and respond to internal metabolic cues.

The obese *were* different from the nonobese in that their hunger ratings at 1 and 2 hours following a meal were lower; by the time of the next meal, their hunger ratings were, on the average, the same as the nonobese. This sharp rise is compatible with the notion that obese people are externally controlled or stimulus bound, and may have been the result of increased hunger brought on by the thought of food caused by taking notice of the amount of time expired since the last meal or the actual presence of food.

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Genetic Counseling: A Consumers' View

Claire O. Leonard, Gary A. Chase, and Barton Childs

Knowledge of genetics and hereditary diseases has added to the physician's role as a counselor the instruction of parents and patients in genetic principles and risk figures. Authorities emphasize that parents should be given information that will help them make rational decisions about further reproduction. This involves the origin of hereditary disease, the risk of repetition, the probability of carrier states, the risk of having affected children, and the incidence of the disease and of carrier states in the population. Most practitioners are aware of successes and failures in genetic counseling, but the evidence is anecdotal, with little attempt at quantitative evaluation.

We present here the results of interviews with the parents of children with genetic diseases who received genetic counseling, and with parents of children with a severe disease of nongenetic origin who received no such counsel.

The families—The 76 families studied were derived from four sources: 39 patients of the Johns Hopkins Hospital Cystic Fibrosis Clinic (CF); seven families ascertained by neonatal screening for phenylketonuria (PKU) and containing no more than one affected child; and 15 families of children with Down's syndrome (DS) seen in the Sinai Hospital Genetic Clinic; 15 families of children seen in the Johns Hopkins Hospital Connective Tissue Disease Clinic (CTD) served as a control population containing children with a chronic, often severe, but nongenetic disease.

The four groups enabled us to study the contribution of various factors to the parents' reaction to the disorder and to counseling. The families were characterized according to disorder, risk of occurrence, burden, the existence of effective treatment, and counseling conditions. By burden we mean morbidity and the possibility of early mortality, together with the physical, emotional, and financial load for the parents.

Counseling—The conditions of the counseling varied. The CF families were counseled by one clinic director and received reinforcement from other doctors on subsequent visits. Many also received literature from the Cystic Fibrosis Foundation. The families with PKU were referred to the Johns Hopkins Hospital where they were followed by one physician for dietary management, genetic counseling, and developmental assessment. The families with DS children were referred to the Clinic, where they were seen twice, initially for karyotyping and then for definitive counseling. The parents of children with CTD received no genetic counseling.

Interview—The interview with the parents, although based on a questionnaire, allowed them ample opportunity to talk spontaneously. The parents were asked to define the disease and to tell how the diagnosis was made. They were then asked if they regarded their child's disease as a reason for limiting family size, and were questioned about their methods of contraception, their attitudes toward sterilization, abortion, antenatal diagnosis, and the effect of the disorder on their sexual relations.

Questions about genetics of the disease involved its cause, the risk of disease and carrier state for subsequent pregnancies, incidence of carriers among relatives, and incidence of the disease and carrier state in the

general population. Other questions were asked to assess the parents' general understanding of biology, genetics, and probability.

Interview Responses

Sources of counseling—The parents of the 61 families with genetic disorders were known to have been counseled. Yet parents of five of these families claimed that they had never been counseled; parents of 11 families said the only counseling was in the clinic; and 45 families acknowledged receiving counseling from their family physician. In addition to professional counseling, 26 CF families were active in the Cystic Fibrosis Foundation or used the literature produced by the Foundation.

Response to counseling—Apparently, the parents saw no need for more counseling, since only two families sought information during the interview. Four families who acknowledged that they had been counseled claimed inability to understand genetics, and five others were unable to apply knowledge of probability and the genetic risks to their specific case. In six families, denial was so strong that the parents could not accept some aspects of the counseling. This record indicates imperfect reception of the genetic message on the part of 44 percent of the 61 families.

Previous knowledge of the disease—Only one-half of the families with genetic disorders had any prior knowledge of the disease in question. Twenty-seven CF families and three PKU families had never heard of the disease before the discovery of their affected child, but only one of the DS families had never heard of that disorder.

Family planning attitudes—Of the 76 families studied, 34 stated that they regarded the disease as a reason for curtailing reproduction. PKU, with high risk and low burden, and DS, with low risk and high burden, were less threatening to the parents than CF.

The attitude toward having more children was significantly related to changes in contraception after counseling; those who saw the disease as a reason to end reproduction were motivated to take steps toward that goal. On the other hand, although contraceptive advice was part of the counseling, 21 of the 61 families with genetic disease were using ineffective or no contraception. These included eight families who believed that their family disorder was a reason for ending reproduction.

Parents were asked their attitudes toward abortion of any pregnancy, sterilization, and abortion after antenatal diagnosis if that was available. A total of 17 families have had sterilizations, and one mother has had a diagnostic amniocentesis for a subsequent pregnancy. Unfavorable attitudes to abortion often became favorable in the context of the possibility of antenatal diagnosis.

Sexual and reproductive behavior—Twenty-three families with genetic diseases reported an adverse effect on their sex lives. In 10 cases, the problem was relieved by a contraceptive change or sterilization.

Ten CF families had 22 children after counseling. Parents of three of these thought that the disease was a reason for curtailing the family; four were ambivalent, one did not think it was a reason, and in two families parental conflict on the point was unresolved. The parents of two PKU families and one of the two DS families who produced more children saw neither risk nor burden as a reason to end reproduction. On the other hand, of a total of 26 pregnancies, in only

three did the parents state that they took a calculated risk. Most of the pregnancies were the result of contraceptive mistakes, or were the product of parents who expressed ambivalence or the overt belief that the disease was not a reason to curtail reproduction. All but two of these were in Roman Catholic families.

Knowledge of Genetics and Related Variables

On the basis of the parents' responses to questions about genetics, it was evident that many parents who gave correct answers did not really understand them. In addition, some parents who did give correct answers denied their validity or said they did not apply to themselves. Others confessed to a lack of comprehension of the correct answers that they had given, and some exhibited a lack of perception of the meaning of the risk. About one-half of the parents had the kind of comprehension that could make the information helpful to them. In about one-fourth their understanding was flawed in some way, and for about one-fourth the genetic counseling had served little purpose. The record was poorest among the parents of CF children, who were followed by many different doctors in the clinic and received counseling from more different sources than the other parents. The record was best in the PKU families who were counseled and given medical care by one physician.

Statistical Comparison of Variables

Statistical significance of relations between variables indicates that the disease that the parents face conditions strongly their attitudes toward further reproduction and use of contraception. The age of both parents was associated with reproductive attitude, whereas religion was associated with performance. Religion also influenced parental attitudes toward sterilization. Attitudes toward further reproduction were independent of education and socioeconomic level, but were associated with acceptance of reproduction control, as well as with the number of children subsequently born, but not with whether or not any were born.

A few parents who had been advised not to have any more children made contraceptive adjustments, and the reception of this advice was associated with a high degree of knowledge and comprehension of genetics.

Parent's knowledge of the genetics of their children's diseases was significantly related to their educational level, their comprehension of probability, their general biologic knowledge, and whether or not they had heard of the disease before experiencing it. There was no significant relation between genetic knowledge and parental attitudes toward reproductive curtailment, methods of reproductive control, or whether or not they had more children.

Genetic Counseling as Preventive Medicine

One model of preventive medicine holds that a person is indifferent to preventive measures unless he understands the seriousness of the threat, perceives himself to be susceptible, and sees benefits in the attention offered.

Decisionmaking about further reproduction—The burden of the disease, as distinct from risk, appears to have a large role in decisions about future childbearing. This was true even of the parents of patients with CTD. As for perception of susceptibility, although these parents knew that there were high or low risks, reproductive decisions were frequently

based on factors other than risk. Knowledge of specific genetic details was of importance to relatively few parents.

Perceived benefits of counseling—Because all these parents were given counseling whether or not they asked for it, we cannot say how many would have seen the benefits and asked for it. However, despite evident lack of understanding on the part of many, the parents of only two families asked for amplification. Lack of perceived benefit also is seen in parents who denied having ever been counseled and in the faulty grasp of the facts exhibited by others.

Barriers

The effectiveness of genetic counseling is measured by the way in which parents use information that they understand and by the extent to which they comprehend it. The principal obstacle to use of information was religion. Obstacles inhibiting understanding of the information were emotional states such as denial, inadequate grasp of probability concepts, and insufficient basic knowledge of human biology and genetics.

Motivation for seeking help—Cues that motivate the individual to seek health care or to comply with advice might consist of articles in the newspapers or magazines, television programs, or disease-foundation programs and literature. The usefulness of these agencies may be limited, however, since studies suggest that they tend to bring knowledge to the knowledgeable and to reinforce existing beliefs. This hypothesis is given support by our observation that the literature of the CF Foundation is helpful as an adjunct, not as a primary motivator.

Perhaps the strongest potential motivator, both for seeking advice and for making use of it, is the physician who makes the diagnosis and cares for the patient. Unfortunately, many physicians do not concern themselves with counseling since about one-fifth of our families said they had had none before their first visit to the hospital clinic.

The physician's personal qualities and ability to communicate are important, and satisfaction with a physician is associated with following his advice. Many of our subjects brought ignorance and sometimes hostility to the consultation, and perhaps some patients were nonplussed by the counselor's recommendation to make up their own minds. This is not what one ordinarily expects from a doctor who normally gives directions.

Genetic counseling has not been in the main stream of research in preventive medicine. It should be. The questions of transmissions of knowledge, risks, and factors that motivate persons to seek or respond to genetic counseling should be studied. In addition, the medical profession might examine its responsibility for promoting the teaching of human biology in primary and secondary schools. Only if there is a solid base of knowledge can the counselor succeed in imparting information that parents can use wisely.

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Drugs and Society: An Ecological Approach

Alfred M. Freedman

Drugs for use in treatment, experimentation, recreation, and abuse have long been with us, but in the past years we have witnessed a proliferation of new drugs, the transformation of other substances into quasi-drugs and, most of all, a host of unanticipated consequences. We appear to be working in two drug cultures. In one we prescribe drugs to treat the mentally ill and emotionally disturbed. In the other, we are responsible for the care of addicts, drug users, and abusers. Often we try to develop abstinence or turn our patients away from drugs. Some are exclusively in one culture or the other, but more and more of us find ourselves in both. Are these really two independent cultures? These distinctions are less and less apparent to legislative bodies that are considering and passing more and more restrictive laws limiting research and treatment with drugs. Much of the impetus comes from concern with drugs that are abused. It seems appropriate at this time to review some of these developments and to propose a broader perspective from which to assess them.

"Good" and "Bad" Substances

The first thought that occurs to one is to distinguish between those drugs clearly of value and those that tend to be more harmful than beneficial. However, in an ever-expanding chemical environment it becomes difficult to standardize judgments on the "good" and "bad" effects of substances. First, therapeutic definitions change. Amphetamines, originally conceived as an alternative to ephedrine in the treatment of asthma and then introduced to combat fatigue, obesity, and depression, are considered by many to have a limited therapeutic use. Second, there are drugs whose therapeutic efficiency depends upon who is determining the indications. One cannot so generalize concerning the efficacy of a drug that we can state unequivocally "it is good" or "it is bad." A drug may be useful in the treatment of an anxiety state, but inappropriate as a counter to the homesickness of a freshman or the tension of a job applicant.

Third, the effect of drugs and quasi-drugs is unclear with respect to relative harm. Here enter into judgment not only matters of fact but also attitudes and social definitions. Tea was considered a harmful substance when first introduced to England. The adverse pathophysiological effects of alcohol are more serious than those of marihuana, but marihuana is socially less acceptable and legally altogether unacceptable.

Lastly there is confusion over the question of the legitimacy of the purveyor. It would be agreeable to think that drugs prescribed by physicians are beneficial because physicians know the correct indications, but one has only to recall the abuse of amphetamines and barbiturates that arises from medical practice.

The typical response is to single out one drug and investigate it comprehensively. We study a drug and learn all about its origins, pharmacology, and the mechanism of its action. If it is a drug we prescribe, we are interested in whether or not it benefits a particular individual. We never ask what effect introducing a drug to this individual will have on the rest of his family or society. We do not think of the long-range consequences of prescribing this drug. In regard to an

abused drug, we look at someone using it and ask, "What is there about this individual's background, interpersonal relations, his development, his physical pathology, or psychopathology that makes it necessary for him to use a particular drug or group of drugs?" Then we study its effects and try to come up with effective therapy for that individual. This approach has yielded valuable data but the ambiguities remain.

A "Macro" View

We need a different set of questions that spring from a "macro" view of the issues. What is there about the structure of society and its institutions that makes it necessary for large sectors of the population to ingest, deliberately or accidentally, quantities of substances that affect the central nervous system? What are the circumstances, the indications, the agents, the situations that initiate use? What are the vulnerabilities of various groups in society? What are the consequences of substance use, any sort of therapeutic drug, or a tube of glue upon the individual and upon society as a whole? What are the consequences of efforts to suppress substance use?

In a sense, man is embedded in a matrix of chemicals that defies comprehension unless brought together in some schematic model. One must look at the whole system, not just the immediate and most distressing effects. We need to develop an ecology that deals with the relations between man and drugs viewed as a specific feature of man's environment.

Historical Origins and Social Use

Interaction between man and drugs has a long history. Once a substance is introduced, a certain principle of contagion seems to come into play, differing according to the nature of the substance. We have categorized drugs according to their chemical structure, their pharmacological action, or their clinical use. It is useful to attempt a loose classification of drugs according to their historical origins and social uses.

1. There is one group of naturally occurring or derived substances that was always used primarily for recreational purposes. Included would be tobacco, alcohol, tea, and coffee.

2. There is another group of naturally occurring substances, of great antiquity and of varying potency, that were originally used for some combination of therapeutic and religious purposes. These were substances that appeared to relieve pain, cure disease, alleviate anxiety, and produce a mystical and/or an ecstatic state, such as opiates, cannabis, cocaine, peyote, and mescaline.

3. More recently, research and development have produced drugs originating from natural substances or totally synthesized by commercial pharmaceutical houses or researchers for the treatment of various conditions. Included would be the opium derivatives, such as morphine and heroin, as well as synthetic analgesics such as methadone, certain antidepressants, tranquilizers, and antianxiety agents. This is such a rapidly proliferating field that one can look forward to drugs for influencing learning and memory; some crystal-ball gazers even predict drugs that will pacify leaders of our nations.

4. Drugs have been developed for other purposes and then found to have effects upon the brain. Among these would be amphetamines, LSD, which was developed as an analeptic, and chlorpromazine, originally part of a lytic cocktail intended to reduce the

temperature and produce a state of hypothermia.

5. Certain substances are concomitants of technological advance. Among these would be gasoline and glue, both of which have had a vogue for ingestion by sniffing.

This typology suggests that the proper study of a drug has to include its history, pathway of introduction, original social or technical use, the subsequent course of events, the mythology surrounding the drug, as well as the political climate.

The history of two of our most popular recreational drugs, tobacco and tea, illustrates the triumph of the "pleasure principle" over initial opposition. The introduction of tobacco prompted European countries to enact laws restricting or forbidding its use. In 1634 the Czar of Russia forbade smoking and ordered both smokers and vendors to have their noses split and persistent violators put to death. In England restrictions were imposed to limit the use of tobacco to the upper classes.

When tea was introduced into England it met with violent opposition, in many respects reminiscent of the opposition to marihuana. Tea was believed to be a noxious drug introduced by Orientals in collaboration with unscrupulous English entrepreneurs. Deterioration of the family and neglect of children were attributed to the use of tea.

Drugs welcomed for their therapeutic value may turn out to be harmful. The origins of opium are lost in antiquity, but its introduction in the United States was for medical purposes. Prior to the American Civil War two important discoveries were made. One was the isolation of morphine from opium and the other was the invention of the hypodermic syringe. Thus, this effective analgesic, morphine, with an instrument to inject, was made available to the medical profession, and it was widely used during the Civil War. Addicted soldiers, diagnosed as having "soldier sickness," were discharged with morphine and syringes.

Opium and morphine were available in pharmacies and grocery stores, and opium was an ingredient in patent remedies. By the end of the 19th century a significant number of people were addicted, but there was no significant criminal involvement or serious social dislocation since supplies were available and these individuals were not defined as deviants. They were mainly respectable middle-class whites. Yet, probably unique in the Western World, we had a large population of opiate-dependent people.

The punitive law enforcement of the World War I era, with the goal of total abstinence, resulted in the Harrison Narcotics Act and the alcohol-prohibitions Volstead Act. The elimination of the narcotic clinics in the 1920's, the abandonment of the field by the medical profession, and the long period of exclusive law enforcement control with the consequent development of an illegal underworld system of supply need not be recounted here. Heroin became the drug of choice for opiate users in the 20's and 30's. It was developed in 1898 by Bayer, the German pharmaceutical firm, as a cough suppressant. It was believed to be nonaddicting. Chloral terpene hydrate with heroin or glycoheroin was a popular cough remedy prescribed by the medical profession.

From the end of World War I to the post World War II period there was a transformation of the addict population from a Southern white group to a deprived minority inner-city population who obtained heroin through illegal channels and were "main-line shooters."

Other examples of therapeutic misfire emerge as synthetic agents have proliferated. After the discovery that amphetamines were powerful central nervous system stimulants, it was not surprising to find them used by soldiers. The questionable use of amphetamines in obesity cures is still with us.

LSD arose out of a search for ergot-like compounds in the hope of developing a drug with analeptic properties, similar to niketomiade. LSD was first used for studies of model psychosis and as a therapy in alcoholism.

Librium was the outcome of a deliberate search for new compounds possessing psychopharmacological activity on the order of the phenothiazines. The search was disappointing until in a cleanup of the laboratory one compound, subsequently named librium, was submitted for pharmacological evaluation.

Societal Determinants

With this proliferation of psychopharmacological agents, use and abuse have spread for purposes beyond pleasure, religious experience, and therapy. When drugs become part of the environment, they may be used in socially channeled ways with consequences that go beyond individual deviance.

The subtleties of these relations may be illustrated in the study on the Rajputs and Brahmins of India. In many parts of India two principal intoxicants are used in the same community. One is daru, a potent distilled alcohol derived from the flowers of the mahwa tree. The other is bhang, a cannabis derivative. The Brahmins, who use cannabis, are committed to a pious, contemplative life of self-denial. They are adjured to avoid anger or unseemly expression of personal feelings. They represent the spiritual aristocracy and unequivocally denounce the use of daru. The Rajputs are a caste of warriors and landlords and are accorded relaxation from such Hindu rules as the prohibition against force and against the taking of life, eating of meat, and use of alcohol. Violence is an integral part of their lives and they are taught the values of individual bravery and ferocity in the face of danger.

Cannabis may have been accepted among those people in India whose cultural background and religious teaching support introspection, meditation, and bodily passivity, while those who value achievement, activity, and aggressiveness have elected alcohol as a euphoriant. One might argue the reverse—that, fortuitously, the Brahmins started using cannabis and became self-contemplative and meditative, while the Rajputs for reasons lost in history began to use an alcoholic concoction and as a consequence displayed aggressive and violent behavior. There may be a dynamic in-between where the needs of a society at a particular moment may be met by the use of a drug with much different consequences further down the road.

A version of this process might be inferred from the sports scene, where the use of drugs by professional athletes appears endemic. A coach has been quoted as stating, "It's a rarity today for someone to achieve athletic success who doesn't take drugs." What will be the consequences, not only on the athletes but on society in general?

One cannot escape the notion that there is a drug that will solve every problem, including children spilling things on the floor, a sudden visit by the in-laws, or moving into a new neighborhood. Any observer of television commercials knows that there

is a solution at the drugstore or supermarket. But it is too simple to attribute this trend to the media, or the pharmaceutical industry, or even to the "youth culture."

The Ecological Model

The ecological model suggests that man and his drug environment are interwoven in a complex system including all social systems. Each part of the system affects all others and the introduction of one drug may alter the balance and relationships existing between man, his drug environment, and many social systems. Likewise, a change in the social system may influence man and his drug environment, increasing, decreasing, or changing his drug use.

Methadone maintenance was introduced as a breakthrough in the pharmacological treatment of narcotic addicts. Yet, one must wonder what effect this new method has had on the whole system of opiate abuse. Studies have suggested that at least one-third of the addict population "matured out" as they progressed through their fourth decade of life. With methadone maintenance there is no longer the need or pressure to abandon drug ingestion. This age group was the bulk of early maintenance programs and is still a significant portion.

Has the switch of long-term users of heroin to methadone released significant supplies to recruit several youngsters to replace one veteran higher-dose heroin addict? A further question is whether the enthusiasm and endorsement of methadone maintenance by important figures legitimized, if not glamorized, opiate use.

We know that some young adults have become users through signing up in a program with a fabricated story. We hear of them when there is a serious or fatal outcome, but it would appear that a number are using this route of entry that does not necessitate criminal involvement, hustling, or experiencing the abstinence syndrome.

It may be that methadone maintenance not only upset the direct man-drug system but that the whole system of social values and opiate use has consequences as yet unanticipated. We must learn how a drug, whether it be methadone or LSD, once introduced into the environment can alter the psychoecology.

My plea here is that we look at the consequences involved in intervention in any aspect of the ecology—man and his environment—including the drug environment. Statements have been made that mankind will have to learn to live with certain drugs and abandon others. Implicit in methadone maintenance programs is the commitment that we will live with opiate use by a significant sector of the population. Such a decision should be made deliberately, with awareness of the alterations that will ensue in the ecology, as well as with the expectation of unanticipated consequences.

I have chosen the opiate addiction field because the interconnections are more apparent. However, the same applies to any drug with a powerful effect on the central nervous system, no matter where it is introduced into the system, even under medical auspices in the treatment of a disorder with low prevalence. This will become more pressing when drugs that alter memory, learning, or behavior are developed.

A further aspect of intervention must be mentioned. Intervention in the sort of ambiguous situations that we meet professionally takes on a life of its own. A drug delivery group, like a law enforcement bureaucracy,

takes on a life of its own and may be self-protective and self-perpetuating, never trying to eliminate the problem for which it was formed. No one intentionally puts himself out of business.

These considerations focus on intervention at the drug supply point. It is evident, if we try to explain the increase in youthful drug abuse in the post-World War II period, that simple explanations are unsatisfactory. I have become persuaded that the crucial alterations in the total system, particularly in our social institutions, are responsible for the shifts we see in the youth—drug interaction, the role of dissent, despair concerning the future, desire for immediate gratification, and solipsism, as contributors in part to the escalation of youthful drug use. Can we go beyond these and look for other structural shifts in the social institutions that may have thrown the whole system, including the drug environment, out of whack?

Urban life in the United States is full of conflicts and ambiguities. People are unclear as to the consequences of their actions, the standards they must meet, and the goals they seek. We seem to be living in a system where values are in inevitable conflict. How, for example, can an advanced technological apparatus function at optimum production levels while individuals in the apparatus seek participatory democracy? Organizations keep going through a series of compromises that permit activity to continue while frustrating the achievement of the goals of any of the contending parties.

A life lived under these conditions is full of strain and anxiety. Just as alcohol has provided surcease from the crushing burden of physical labor, so the laxatives, antacids, analgesics, tranquilizers, and narcotics of the modern world provide palliatives and escape mechanisms from what the young call "hassles." I suggest that widespread drug use is a response (although not the oniy response) to new definitions of social problems, if not to the emergence of new problems themselves.

In one such development, notions of man's perfectability and the inevitability of progress have been replaced by modern versions of man's sinfulness and apocalyptic views of the future. It is not just nuclear technology that is responsible for current waves of pessimism. The revolutionary and Napoleonic eras at the turn of the 19th century brought a profound change in the quality of expectations of progress and of personal and social enfranchisement. It was as if the millenary horizons suddenly moved close. In spite of setbacks and defeats, man formed a mental notion of a brighter future, which became the driving force of western culture. World War II and the holocaust brought this epoch to an end.

In the meantime, different perceptions of man's hope have emerged, perhaps related to loss of faith in collective progress, or perhaps independently. One of these is the belief in self-actualization as a personal goal. In the 18th century a redefinition of the right to franchise, personal liberty, and freedom of the press took place. Whereas the inability to enjoy such rights, particularly by the less privileged classes, had been considered a misfortune, it came to be regarded an injustice. In the 19th and early 20th centuries, and now in certain circles, poverty was defined as a misfortune. Since its redefinition as an injustice, social movements have arisen to demand the material necessities of life.

In much the same way, a sense of personal worth and identity has come to be demanded as a right. The demand that the institutions of our society be reformed, not primarily to grant man freedom of speech and thought and not primarily to assure him essential comforts, but to guarantee him a sense of personal worth, is a new and recurrent theme in society. It is no accident that the preoccupation is initially in the psychological sphere. The unparalleled freedom and capability of the young are not matched by an institutional structure that facilitates their self-actualization. Adolescence is peculiarly a "nonperson" status, and yet it is the period in life when technical skills and new freedoms are growing the fastest. The same sense of injustice is understandable in other groups, i.e., minority groups and women, who experience the same failure in their quest for personal worth and dignity. Part of this sense of injustice, entwined with a feeling of powerlessness, is an emerging variety of patterns, one of which is the wide use of drugs among young people. We behavioral scientists must play a role in developing techniques that provide a sense of personal worth and dignity to populations at risk, e.g., the young, minorities, or women.

It is only with such considerations that we can begin to understand the dissonance and striving that give rise to the escalation of drug use in the world today. As scientists, as psychopathologists, we have to push on, try to develop new drugs to treat mental illness, facilitate learning and memory, and restore brain function in the aged. On the other hand there are those, even in scientific circles, who advocate stopping and turning back to a simpler life, without drug abuse or the other dissonances of modern society.

Thus we are faced with a cruel dilemma: Should we stop or go ahead? In his essays, *In Bluebeard's Castle*, George Steiner characterizes the dilemmas of today. The title is taken from Bartok's opera of the same name in which Bluebeard's last wife, driven to unlock every door in the castle until she learns the ultimate in destructive truth, opens the last door and finds the night. We scientists are driven to open the successions of doors. Steiner says that we are standing before the last door. This is terrifying and one would hope to turn back but one cannot. With our profession's scientific skills and humane sensitivity, we can light the way beyond the last door so that there will be a future.

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Psychiatric Utilization Review as Patient Care Evaluation

D. Riedel, M. H. Brenner, L. Brauer, P. Goldblatt, G. Klerman, J. Myers, C. Schwartz, and G. Tischler

Utilization Review is now a formal requirement for community mental health centers as it is in general psychiatric hospitals and extended care facilities. These requirements, and the need for systematic approaches to the evaluation of appropriateness of patient care, was the basis for the Psychiatric Utilization Review and Evaluation (PURE) Project. The project is a collaborative venture by members of the Connecticut Mental Health Center and the Departments of Psychiatry, Epidemiology and Public Health, and Sociology of Yale University. Members of the Administration Science Department at Yale, and the Multi-State Information System, and the Connecticut Utilization and Patient Information Statistical System acted as consultants.

During the early stages of the PURE Project, it was felt that five main components in the patient care appraisal process deserved immediate attention:

- Development of sophisticated screening mechanisms to select cases for review.
- Development of adequate guidelines (or explicit criteria) for the evaluation of care, not only to cut down the time involved in utilization review, but also to assure more valid and reliable estimates of the level of appropriateness of care.
- Development of more adequate instruments for collection of data pertaining to the patient care process, including mechanisms for abstracting patient records either while the patient is under treatment or on a retrospective basis.
- Assessment of factors involved in the actual process of evaluation of care by the reviewing physician.
- Extension of the concept of patient care appraisal beyond institutional stay to include the complex of care pertaining to a given episode of illness. This involves epidemiological surveys and followup studies.

For several years, researchers at Yale University have been engaged in a study to develop techniques for use in alternative models of patient care appraisal in general hospitals. One model is the Basic Utilization Review Program (BURP). While constructed for use in general hospitals, the logistical aspects of BURP and the objectives of its components have implications for psychiatric utilization review.

BURP incorporates the first-stage screening mechanism based on probability and purposive sampling techniques, problem-specific criteria (guidelines) for case evaluation, chart-abstracting techniques to facilitate the review process, and system-monitoring and feedback mechanisms to insure efficacious case selection and appraisal. The core of this program is a patient-classification scheme based on a unique combination of diagnostic and demographic characteristics. Empirical norms are established for each class of patient, and statistically deviant cases are identified for further review.

Detailed clinical information is abstracted from the patient's chart by paramedical personnel and the abstract evaluated according to guidelines specific for each diagnosis. The criteria specify the conditions under which a patient should be admitted to the hospital, the procedures required by, consistent with, and contrain-

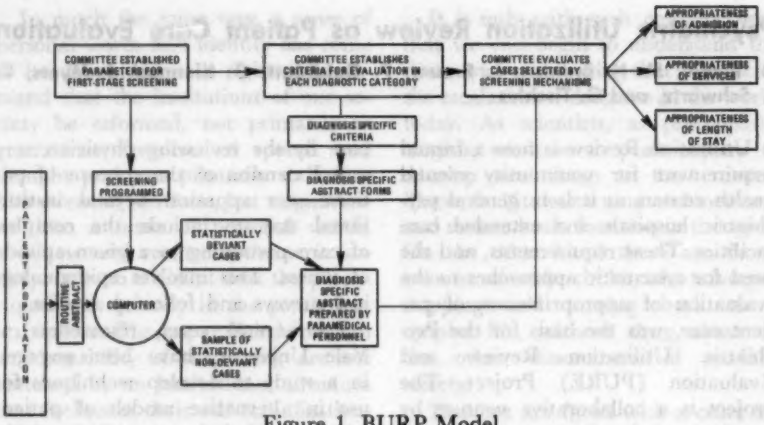
COMMITTEE ESTABLISHED PARAMETERS FOR FIRST-STAGE SCREENING
COMMITTEE ESTABLISHES CRITERIA FOR EVALUATION IN EACH DIAGNOSTIC CATEGORY
COMMITTEE EVALUATES CASES SELECTED BY SCREENING MECHANISMS
APPROPRIATENESS OF ADMISSION
APPROPRIATENESS OF SERVICES
APPROPRIATENESS OF LENGTH OF STAY
DIAGNOSIS SPECIFIC CRITERIA
SCREENING PROGRAMMED
DIAGNOSIS SPECIFIC ABSTRACT FORMS
PATIENT POPULATION
ROUTINE ABSTRACT
COMPUTER
STATISTICALLY DEVIANT CASES
SAMPLE OF STATISTICALLY NON-DEVIANT CASES
DIAGNOSIS SPECIFIC ABSTRACT PREPARED BY PARAMEDICAL PERSONNEL

Figure 1. BURP Model

dicated by the diagnosis, and the requirements for discharge. The results of the evaluation are used to determine the efficacy of the initial screening and the adequacy of the guidelines used in the detailed review. Feedback from the committee permits adjustments in the guidelines so that cases with a high probability of requiring review will continue to be identified by the screening program. (The BURP model is shown in Figure 1.)

The development of this approach was encouraged in general medicine by the extent to which diagnosis determines treatment. Utilization review in psychiatry is more complex because the relationship between diagnosis and treatment and the efficacy of different treatment modalities are not clearly established. Consequently, there is a lack of predictive knowledge which sets inherent limits on the review process.

Aims

During the first 2 years of the PURE Project the aims were:

To develop a model of utilization review suitable for mental health centers which would show the utility and interrelationship of the various components of the utilization review system, that is, criteria of adequacy of care, mechanisms for selecting cases for review, followup studies, and special studies, such as epidemiologic examination of patients to determine their representativeness of the areas from which they come.

To determine the best means to construct explicit standards for adequacy of care through the use of different approaches, such as diagnosis, symptom, developmental epoch, or institutional process, by panels of clinicians.

To delineate the strategic patient characteristics for first-screening process in utilization review, based on the work on norms as developed by panels and on the detailed analysis of patterns of care.

To construct mechanisms for case selection, based on the combinations of patient characteristics specified above.

To implement the components of the review mechanisms in the Connecticut Mental Health Center.

To construct a set of components

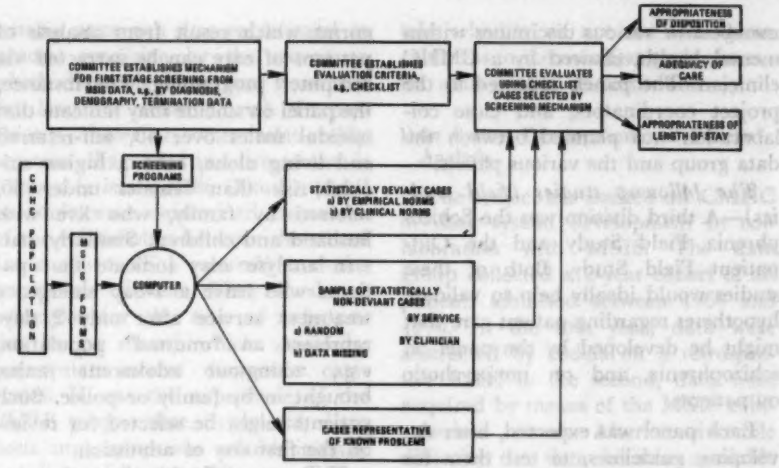
COMMITTEE ESTABLISHES MECHANISM FOR FIRST STAGE SCREENING FROM MSIS DATA, e.g., BY DIAGNOSIS, DEMOGRAPHY, TERMINATION DATA
COMMITTEE ESTABLISHES EVALUATION CRITERIA, e.g., CHECKLIST
COMMITTEE EVALUATES USING CHECKLIST CASES SELECTED BY SCREENING MECHANISM
APPROPRIATENESS OF DISPOSITION
ADEQUACY OF CARE
APPROPRIATENESS OF LENGTH OF STAY
SCREENING PROGRAMS
CMHC POPULATION
MSIS FORMS
COMPUTER
STATISTICALLY DEVIANT CASES a) BY EMPIRICAL NORMS b) BY CLINICAL NORMS
SAMPLE OF STATISTICALLY NON-DEVIANT CASES
a) RANDOM
b) DATA MISSING
BY SERVICE
BY CLINICIAN
CASES REPRESENTATIVE OF KNOWN PROBLEMS

Figure 2. BURP as Modified for Psychiatric Utilization Review

for a patient care evaluation system for possible use in other centers.

To document the problems involved in setting up a model for utilization review in psychiatry.

Thus, there are three major phases to the project: the development of criteria for evaluation and mechanisms for case selection; the testing of criteria and mechanisms; and the implementation of a system of patient care evaluation.

Methodology

It was decided that the initial stage of the project would move along a number of fronts simultaneously. The five original coprincipal investigators represented a wide range of disciplines. This group, along with the project coordinators, acted as a planning committee which set policy and watched over the activities that were subsumed under the project. Briefly, the main parts of the project were as follows:

The data group—The principal task was to perform a retrospective analysis of the data available in patient records at the Connecticut Mental Health Center (CMHC). This material was intended to be useful for hypothesis-testing by the panels and in developing statistically normative patterns of care. The group had the responsibility to provide assistance to the Records and Information Department of the CMHC in developing their records and in working with the Multi-State Information System (MSIS) in helping the center to computerize records. The group also assisted in the development of forms necessary to obtain information of importance for case review. In addition, the group provided assistance to the CMHC administration in preparation of data for administrative reports. In so doing, the value of a well-functioning data system was demonstrated.

The clinical panels—In this part of the project there was diversity to allow the determination of the best means of approaching utilization review in mental health. There were panels on adolescence, schizophrenia, suicide, and intake, made up of

members of various disciplines within mental health, chaired by a CMHC clinician. The panels reported to the project coordinators, and close collaboration was planned between the data group and the various panels.

The followup studies (field studies)—A third division was the Schizophrenia Field Study and the Outpatient Field Study. Both of these studies would ideally help to validate hypotheses regarding patient care that might be developed by the panel on schizophrenia and on nonpsychotic outpatients.

Each panel was expected, after developing guidelines, to test them for feasibility, reliability, and validity. For this purpose the panels were provided during the second year of the project with research assistants and computer programing assistance as well as any necessary ancillary personnel within budgetary limits. The data group again was to oversee and provide technical assistance in the area of data collection.

Development of a Model

The BURP model constitutes the core of the method developed. The expanded BURP model is shown in Figure 2.

The information which is the basis for selection comes from precoded data, recorded in the MSIS record, rather than from data abstracted by paraprofessionals from the chart. These data include a face sheet containing identifying and demographic information, a diagnostic report form, a change of status form which locates the patient within the center, an outpatient treatment form, a field station contact form, and a mental status form. Medication and basic history forms will soon be included. Those charts which violate norms suggested by panels of clinicians, or norms which result from analysis of patterns of care can be extracted via computer programing. For instance, the panel on suicide may indicate that suicidal males over 40, self-referred and living alone, have a higher suicidal risk than females under 30, referred by family, who live with husband and children. Similarly, pattern analysis may indicate that patients who leave a 7-day emergency treatment service after only 2 days represent an "unusual" population, e.g., acting-out adolescent males, brought in by family or police. Such patients might be selected for review on the first day of admission.

There are difficulties in performing pattern-of-care analysis due to the problem of defining the appropriate dependent variable. In the BURP model, surgical patients were classified by diagnosis; length of stay was the dependent variable used for selection. Patients who stayed significantly longer or shorter than the mean for such diagnosis would be selected for review. Sociodemographic and other factors besides diagnosis can be used for selection in psychiatry. Furthermore, dependent variables other than length of stay, e.g., nature of the care rendered, may be a more useful variable, since length of stay in psychiatry is often determined by institutional policy. Thus, we may ask: Is the patient hospitalized? Is the patient treated? If treated, is he given drugs? Is he referred? Although such dependent variables are not continuous, as is length of stay, there are statistical techniques which can be used to identify deviation from norms for discontinuous variables.

The second way in which the BURP model has been modified is in the establishment of some criteria of quality of care on a basis other than diagnosis. The development-of-

criteria approach was encouraged in general medicine by the extent to which diagnosis determines treatment (at least for acute illness). In psychiatry, however, the relationship between diagnosis and treatment is frequently less specific. Thus, a panel on adolescence determined the nature of the relationship between the school (as a source of a referral) and the responsible clinician. They developed principles for the type of information to be shared which would be appropriate across diagnostic categories. It was the experience of the PURE project that, in general, diagnosis and symptoms would initially be the quickest and most efficient way to develop guidelines for individual case review, whereas broader classifications such as adolescence or intake lend themselves to establishing guidelines for program or institutional evaluation. The task of criteria development is made more complex in psychiatry by the ideological commitments of psychiatrists which often determine the patients they serve, the treatment they use, and the results they cite as evidence of success or failure.

The third change in the BURP model was the introduction of a checklist which can be used in testing whether a chart selected for review does reveal inappropriate care. The more the checklist is refined and operational definitions made clear, the more it can be applied by paraprofessionals, allowing clinicians to deal with fewer, but more rewarding problems raised by a given chart.

The final change in the model is introduction of outcome and special studies as an aid to developing and testing criteria. While a review process cannot impose standards by fiat on an institution where practice may differ from established norms, it can ascertain whether or not the care given conforms to the manifest goals of service units within an institution.

Data System Development and Pattern Analysis

The project has assisted the CMHC in data system development in collaboration with MSIS. The data group collected a 2-year cohort of all patients admitted between 1968 and 1970. In the first year, data were abstracted by coders on a retrospective basis; in the second, data were acquired by means of the MSIS computerized records. After considerable difficulty the data became available for pattern analysis, and a model for approaching patterns-of-care analysis resulted. We have begun to identify the important variables which should be collected. For example, it appears that the major descriptors that affect deviation from "normal" patterns of treatment are: social class, town of residence, age, and admitting diagnosis.

Criteria Development and Checklist: Problems of Ambiguity

Since one of the aims was to examine the ways different panels did their work, the initial charge to the panels was somewhat vague. Also at the beginning, the model relating components to each other was not worked out. Panel chairmen and members raised a number of similar criticisms. They were not sure what was meant by a guideline—whether it was to be a guide or a rigid standard. Comments were made that it would not be possible to set standards in mental health, that insufficient information was available, that there was no proof that one treatment was more valuable than another, that more research was needed to test guidelines, and that there was fear

that the guidelines the panels did develop might be used rigidly.

The Adolescence and Intake Panels complained that their areas were too large to be dealt with in such a short time. In contrast, the Schizophrenia and Suicide Panels more quickly delineated their area of interest. There was tension between the research interest and the more pragmatic interest of the PURE project itself and ambiguity about the amount of time to be devoted to each of the tasks. It is doubtful that there could have been much reduction in this ambiguity. In fact it was our observation of the ways in which the task was handled by different panels that enabled us to provide the conclusions we have reported. Often the criticisms reflected anxieties natural to participation in an endeavor in which there is no one clear solution.

Criteria Development and Checklist: The Panels

The project developed several criteria to determine adequacy of care, especially in the initial evaluation prior to assignment to treatment (and presented in an Admissions/Intake Checklist). It also developed criteria for adequacy of care in suicide, adolescence, and schizophrenia. The results are summarized below:

The Intake Panel engaged in several studies. They examined the utilization of the CMHC as opposed to other agencies by census tract, compared patients coming to the Yale-New Haven Hospital Emergency Room with those coming to the CMHC, and developed some guidelines for clinical intake.

The Adolescence Panel developed the hypothesis that discrepancies between the adolescent's perception of his problem and the clinician's would have an impact on the results of the intake and treatment process. They devised a protocol to test the hypothesis the panel developed from a Chief Complaint Questionnaire, by abstracting the complaints of a representative sample of adolescents who utilized the CMHC. They are now determining the effects of discrepancies in perception of the main complaints between the patient and his clinician.

The Panel on Suicide studied suicidal patients who used the services of the Yale-New Haven Emergency Room and the CMHC. This study was undertaken to validate guidelines they developed. They uncovered several areas of inadequacy in the treatment of suicidal patients, and were able to make specific recommendations to the director of the CMHC.

The Panel on Schizophrenia reviewed charts and developed guidelines. Their research focused on the development of a diagnostic checklist which would assure that patients who are diagnosed as schizophrenic should fall into this category. For example, if a patient is diagnosed as schizophrenic but does not score sufficiently high on the Diagnostic Checklist to warrant the diagnosis, the chart will be selected for review. The Panel worked with the Schizophrenia Field Study and modified some of its guidelines on the basis of their review of charts. For example, the Panel felt at first that acute hospitalization should last about 6 weeks, but in reviewing actual cases they found this was probably too short a time.

Assessment of Best Approach to Criteria Development

To what degree was the task of criteria development better performed by one panel or another, aside from personality and group-dynamic factors?

Our conclusion is that the goal should determine the approach to be adopted. If the goal is to develop mechanisms and guidelines suitable for individual case review, then medical diagnosis would be the most efficient way of proceeding. Conversely, if the goal is in the area of overall program concerns, then setting up panels along the lines of the Intake of Adolescence Panels would be the best way to proceed. Institutional questions such as confidentiality, the nature of the relationship of the center to the community and to other agencies or programs for the aged, are best dealt with in panels not organized by diagnoses.

If we look in more detail at the deliberations of our panels, we find that the Adolescence and Intake Panels experienced difficulty in setting a limit to the scope of their inquiries. When there was a need to develop guidelines suitable for individual case review, these panels fell back on a more diagnostic or symptomatic approach. The Adolescence Panel, for example, developed guidelines for distinguishing psychotic processes from organic ones and specific standards for the "disorganized adolescent." On the other hand, the panel has a number of guidelines for judging overall evaluation of a center's programs for adolescents and touching on more general issues, such as the relationship which should exist between a mental health center and community schools, other referral sources, or the draft board. In contrast, the Suicide and Schizophrenia panels were immediately able to develop criteria for individual case review. Although these two panels touched upon larger institutional issues, such issues are not dealt with in the same richness of detail as in the Adolescent or Intake Panel.

Preliminary Results From Followup Studies

The Schizophrenia Field Study interviewed patients 2 years after discharge from several mental institutions. A not unanticipated finding was that most patients with the diagnosis of schizophrenia receive a major tranquilizer as part of their treatment. This finding combined with the deliberations of the Schizophrenia Panel led to the guidelines that all cases in which a schizophrenic patient does not receive major tranquilizers should be reviewed. The Schizophrenic Field Study also is beginning to identify those patients with a high risk of poor prognosis.

The Outpatient Field Study followed a group of patients at intake and interviewed them a year later to examine a number of factors in the intake process, i.e., catchmenting a service, patient expectations and patient symptoms, on intake and subsequent treatment. This group is now examining the results of a multiregression analysis, which it is hoped will provide some idea of the relative importance of these factors in determining whether or not a patient remains in therapy.

Selection Mechanisms

We have developed preliminary mechanisms for selection of charts. At this point in time, the criteria exist primarily as caveats in the Chart Review Checklist. With some modification many can be programed as selection mechanisms. Since the review of individual cases might have different purposes, there are different mechanisms for selection charts for review.

These considerations suggest three types of mechanisms for selection of charts: A random selection of cases by service and clinician with each service

reviewed monthly and each clinician at least annually; selection of problems; and selection by pre-established mechanisms.

The capabilities of standard programs within the MSIS system, which the project would use for retrieval, have been limited largely to sociodemographic variables and primary diagnosis. Many clinical and empirical norms are based on this information, and the retrieval capabilities of the computer system are not equal to the sophistication of the suggested retrieval mechanisms. At this point in the development of the "state of the art" of psychiatry, as well as the state of information systems and computer retrieval mechanisms, charts can be selected with an increased probability of showing deviations from norms of usual clinical care. It is not conceivable in the immediate future to computerize entirely the evaluation process. There is no substitute for the judgment of clinicians in taking a second look at the multiplicity of factors in a given case, utilizing some pre-established guidelines.

In summary, the PURE project has developed the components of a program for patient care evaluation suitable for implementation in community mental health centers and has reached the following conclusions:

Guidelines for individual case evaluation in psychiatry are best developed along diagnostic or symptom lines. Guidelines for program evaluation are best developed by focusing upon institutional processes and broader social issues.

A utilization review system has been developed. The components of the system include: a data system, preferably (but not necessarily) computerized; mechanisms for selection of charts for review; guidelines to evaluate quality of care; indications for supplementary epidemiological surveys (special studies) and followup studies.

The components of the system are as yet incomplete and will require protracted further development.

Implementation initially should aim at reviewing broad patterns of care with individual cases serving illustrative purposes.

The PURE project will conduct a sequel to the initial project—implementation, modification, and evaluation of the patient care appraisal mechanism in four community mental health centers. The project has six principal objectives: field testing components in three centers; incorporation of advanced review techniques in the Program Information and Analysis Section of the Connecticut Mental Health Center; modification of specific techniques according to the goals, objectives, and resources of the mental health centers; development of compatibility of the mechanisms of the utilization review process with the capabilities of the Multi-State Information System. The long range goal is to develop a mechanism that can have its basic data-processing support from MSIS or another computerized recordkeeping system; refinement and elaboration of screening and analytic processes for case selection and routine monitoring; evaluation of the performance, feasibility, acceptance, and cost of implementing and operating the basic utilization review program in those centers where implemented.

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Mental Health News Digests

Mental Health Training and Research Programs at Saint Elizabeths Hospital

The Winfred Overholser Training and Research Division of Saint Elizabeths Hospital is nearing completion of its first year of educational and research activities.

It has consolidated the activities of 50 staff employees and 80 trainees from 13 different training programs in carrying on the functions of the former Vestermark Division of Intramural Training and the former Overholser Division of Clinical Research.

The Overholser Division has responsibility for conducting accredited rotating internship and psychiatric residency programs, as well as an internship in dentistry and residency training in opthamology and pathology. Graduate programs are also carried out in nonmedical disciplines related to the mental health field such as clinical psychology, psychodrama, nursing, recreational and occupational therapy, social service, dance therapy, and the Catholic and Protestant chaplancies. The Division provides and supervises affiliations, clerkships, and practical experience in medicine, social service, nursing, clinical psychology, the rehabilitation therapies, and volunteer services. It fosters cooperative relationship with institutions of higher learning, such as the George Washington University and its Medical School, and is available for collaboration with Division of Manpower and Training Programs of the National Institute of Mental Health.

Additional dimensions include collaboration with other Saint Elizabeths Hospital components in providing extensive in-service training in psychiatric nursing and in developing training programs in group dynamics and group therapy. Special educational clinics and programs in mental health are conducted by the Division for community clergymen and for law-enforcement agencies such as the Metropolitan Police Department and the U. S. Secret Service.

The Research component investigates psychological, ecological, and cultural aspects of normal, criminal, and assaultive behavior, shares responsibility for the technical review and evaluation of research conducted throughout the Hospital, fosters cooperative relationships with educational institutions in areas which concern research and teaching, and participates upon request in evaluating the effectiveness of training and treatment programs.

Five types of medical student programs, including a clinical clerkship in psychiatry for George Washington University medical students, complement the 30 paid positions currently filled by rotating interns and psychiatric residents. The Overholser Division's Psychiatry Training Faculty which conducts these programs is supplemented by a large staff of supervisors and senior consultants, emphasizing an interdisciplinary, community-oriented approach to clinical services.

Among the nonmedical training programs, the group training section conducts eight major interdisciplinary hospital group-work programs, while clinical psychology provides a varied clinical or research experience for 15 psychology graduate students. The Protestant chaplaincy offers a full-time, 3-year mental health training program for clergy, placing heavy emphasis upon clinical community assignments in Mental Health Service Area D in Southeast Wash-

ington, while the Catholic chaplaincy provides a 1-year training program in clinical pastoral work for priests. Psychodrama, social service, occupational therapy, recreational therapy and dance therapy sections provide substantial service to patients in addition to offering paid training positions for undergraduate and graduate matriculants. Nursing education supports mental health training for several hundred students per quarter from ten nursing schools at the Diploma, Bachelor, Associate, and Master's Degree levels.

Educational activities also include a Training Newsletter, a Spring Family Therapy Symposium, and an Overholser Day of clinical presentations by trainees and invited guests.

(Adapted from a report by Daniel D. Cowell, M. D., Acting Director of the Overholser Training and Research Division, in the August 1972 issue of the *Medical Annals of the District of Columbia.*)

Nursing Grants for Training in Community Mental Health

Four grants to develop leadership in psychiatric nursing for community mental health programs have been awarded by the National Institute of Mental Health.

The University of Delaware in Newark, Delaware, under a grant of $50,188 to the School of Nursing, will train graduates of the master's program in psychiatric-mental health nursing for community leadership. The work-study program includes 9 months of clinical work in a community mental health center.

The Orange County Community Mental Health Services of Santa Ana, California, has been awarded $28,080 for study to analyze the role, function, and skills of nursing personnel. The study is designed to help delineate the future role of the nurse in community mental health programs. This project will be part of an overall manpower evaluation program currently under development by the Orange County Community Mental Health Services.

A grant of $72,930 will help support a doctoral program at the University of Pittsburgh School of Nursing in Pittsburgh, Pennsylvania. The program will train clinicians at the graduate level in the area of psychiatric-mental health nursing, leading to the degree of Doctor of Philosophy in nursing. The program will provide clinical experience, research, interdisciplinary curricula, and training in administration.

The University of Puerto Rico in San Juan, under a grant of $30,063, will prepare professional nurses for supervisory positions in hospitals and in community health agencies.

Additional information may be obtained by writing to Dr. Francis N. Waldrop, Director of the Division of Manpower and Training Programs, NIMH.

Home Education Project for Inner City Preschoolers

An experimental home education program for children in a disadvantaged Chicago neighborhood will be staffed by a specially trained team of community women. The research project will be conducted in Chicago's Lawndale area, and is designed to reach 15 or more families unable to bring their children to a neighborhood child development center.

A team of three community women will be employed and trained. They will make weekly visits to the participating families, bringing learning materials to the child's home, and demonstrating how they should be used. Each week new learning materials will be supplied and left in the home for the parents and child to work with.

A project psychologist will give in-service training to the project team, and also offer family therapy to the Lawndale families if it is needed. The children will be given yearly intelligence testing, and there will be a followup program to determine whether gains made at ages 2 to 3 years hold through later schooling and into adulthood.

The residents of the 8-block area are predominantly black and are recent migrants from the South. The adult educational level is below the 8th grade, with an apparent average reading ability of the 4th grade. The average annual family income is low.

By focusing on community strengths, such as the ability of Lawndale residents to cooperate on a goal important to them—the education of their children—and the involvement of the total home rather than the children alone, the project seeks to establish a model that will work in many different types of communities.

The project is headed by Sister Margaret I. Healy, Ph.D., Director of Teacher Education at Mundelein College in Chicago.

First Awards in New Addictions Training Program

The first grant awards under a new Federal program to improve training in drug and alcohol abuse in medical schools have been announced jointly by the National Institute of Mental Health and its component, the National Institute on Alcohol Abuse and Alcoholism. The purposes of the program are to increase the academic faculty in medical schools who are knowledgeable about drug and alcohol abuse and to aid the schools in developing regular courses of instruction on these problems.

The grants provide medical faculty the opportunity to pursue expertise in drug and/or alcohol through 1-3 years of specialized training. The faculty members then have the responsibility to assume leadership in developing curricula within their medical schools in these areas. This will improve and expand the level of training which medical students and other health personnel will receive on addictive disease, with the ultimate objective of improving the medical care offered to persons suffering from these health problems.

Seven of the grants will give the following faculty members the opportunity for specialized training. Dr. Pierre Renault, University of Chicago; Dr. James Halikas, Washington University; Dr. Jerome Levy, University of New Mexico; Dr. Jules Golden, Albany Medical College; Dr. Kim Keely, Medical University of South Carolina; Dr. David Eiland, University of Texas; and Dr. William Flynn, Georgetown University. The eighth grant, to Baylor College of Medicine, is to establish a Career-Teacher Training Center in Addictions to train medical and other university faculty in the fields of narcotic addiction, drug dependence, and alcohol abuse. The goal of the Baylor program is to provide a full range of clinical and didactic experience including exposure to research approaches and community programs.

Information about this grant program may be obtained from the Division of Narcotic Addiction and Drug Abuse or the National Institute of Alcohol Abuse and Alcoholism, National Institute of Mental Health, 5600 Fishers Lane, Rockville, Md. 20852.

Study of Children Born Vulnerable to Mental Disorders

What happens to children who are born vulnerable to mental disorders? How do families cope with serious mental disorder in a parent and how does this affect the development of children in these families?

With the help of a grant from the National Institute of Mental Health, researchers at the University of Rochester Medical Center will study this problem in depth. The research is designed to study the vulnerability and invulnerability to mental disorders of children from infancy to adolescence. These children were born to families in which one or both parents have a history of a variety of mental illness. The results of these studies may contribute to improved prenatal care, extra precautions during the birth process, and subsequent counseling with parents in order to strengthen the family's role in the upbringing of the child. The study will involve 240 families and will be a major venture in the department's research program. About 25 faculty members, with diverse professional skills, will participate.

The principal investigator is Dr. Lyman C. Wynne, Chairman of the Department of Psychiatry at the University of Rochester Medical Center.

Fellowships for Training in Drug Abuse

A psychiatrist, a police chief, a sociologist, a minority education expert, an historian and a journalist are among those who have been brought together in a $300,000 program to combine talents in a new coordinated research effort in the field of drug abuse.

The nine fellowships were awarded by the Drug Abuse Council, an independent, nonprofit national organization established in February by the Ford Foundation, Carnegie Corporation, Commonwealth Fund, and Henry J. Kaiser Family Foundation and based in Washington, D. C. The Council supports research, evaluation, and information activities in a variety of drug abuse related areas and a major goal of the Council is to clarify the options available for public policy on drug abuse issues at the local and national level.

Besides working on individual projects, the Fellows will be available as a team of consultants to provide seminars for public officials and policy makers as well as to help plan the Council's future activities.

The nine Fellows are: Robert P. Bomboy, journalist, Chicago Center for Policy Study; Edward J. Casavantes, psychologist, U.S. Civil Rights Commission; Harvey H. Feldman, sociologist, Brandeis University; Patrick H. Hughes, epidemiologist and psychiatrist, University of Chicago; David L. Lewis, historian, Federal City College, Washington, D. C.; Jerry Mandel, criminologist, Sonoma State College, California; David F. Musto, historian and psychiatrist, Yale University; Wesley A. Pomeroy, law enforcement official and attorney, Minneapolis; and Margaret Tripp, psychiatrist, London, England.

Applications are now being received for the fellowship term beginning in September 1973; selections will be made in March. The address of the Drug Abuse Council is 1812 L St. N.W., Washington, D. C. 20036.

recent nimh publications

Single copies of these publications may be obtained from the Public Inquiries Section, National Institute of Mental Health, Room 15C17, 5600 Fishers Lane, Rockville, Md. 20852. A complete list of all publications available from the NIMH may also be obtained from the Public Inquiries Section. If a price is given, the publication may be ordered in quantity from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Enclose a check or money order payable to the Superintendent of Documents.

Acute Conditions. Incidence and Associated Disability United States—July 1969–June 1970. Series 10, No. 77. A 65-page booklet of data collected in a continuing national household interview survey. Statistics on the incidence of acute illnesses and injuries and the associated days of restricted activity, bed disability, and time lost from work and school are given. These figures are listed according to age, sex, calendar quarter, residence, and geographic region. DHEW Publication No. (HSM) 73–1503. 65¢.

Correctional Treatment in Community Settings. A Report of Current Research. By Marguerite Q. Warren. This report focuses on current studies of various treatment elements utilized in probation and parole settings in 25 countries and the United States. Also discussed are the organization of resources for treatment, research methodology, innovative treatment programs, and current themes and trends in the field. DHEW Publication No. (HSM) 72–9129. 35¢.

Spanish–Language Health Communication Teaching Aids. This 55-page pamphlet lists Spanish-language health communication printed materials and their sources. DHEW Publication No. (HSM) 72–19.

Alcoholism and Its Treatment. Explains alcoholism as an illness, itemizes symptoms, causes, treatment, and sources of information for local facilities. DHEW Publication No. (HSM) 73–9025.

Homosexuality: Final Report and Background Papers. This book presents the final report of the National Institute of Mental Health Task Force on Homosexuality together with the seven specially prepared papers which served as the educational information and issue base for this group. Five of the papers are being published for the first time in this book. DHEW Publication No. (HSM) 72–9116. 75¢.

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